Volume 94 Number 8

STEEL

Production · Processing · Distribution · Use

The Week in Perspective

RUSSIAN BUYING of oil country goods and refinery equipment looms important as credit facilities near materialization. RFC funds may guarantee 70 per cent of the value of such purchases. A 40,000-ton pipeline inquiry, shelved for several weeks, is again in the limelight. Heavy buying of track material also is seen likely. p.15

FOLLOWING THE LEADER in streamlining, in this case Chrysler, other auto builders are reported designing their own "airflow" models. p.17

NATIONAL OPERATING RATE, universally accepted index of steel production, stepped up another rung last week to 43 per cent, highest since first week of September. p.13

EIGHT TIMES I have seen the country sink into some sort of depression and each time men have risen to announce that we have ridden into the slump on our machines. I deny this!"—E. T. Weir. p. 13

NEWEST BRAINSTORM for unemployment relief is for the government to buy up and scrap all continuous mills, which will then revert to hand labor. p. 15

TRACTORS leave the farm and help railroad welding crews to move their heavy generators along the tracks. p. 28

INCLUSIONS, once condemned as injurious to steel, now are recognized as conveying desirable properties, if in submicroscopic state. p. 32

CODE AUTHORITIES in some 300-odd industries are packing their bags and complaints for General Johnson's "town meeting" in Washington, March 5. p.10

PIPELINE CORROSION may be severe in gas lines where traces of hydrogen sulphide are present, especially if any precipitated water clings to the pipe walls. p. 27

EMPLOYMENT in the iron and steel industries of California in the last three months of 1933 came near to equaling the 1931 total of 50,000. p. 14

STEEL PAVING, recently laid in Germany, comprises zig-zag steel grate rods welded or bolted to a base, interstices being filled with gravel. p. 25

SNIPING AT PRICES of steel, automobile manufacturers perhaps do not realize that 1934 car prices have made a much higher rebound toward 1929 levels than have steel quotations. p. 18

THREE-BILLIONTHS of an inch! Engineers are working on apparatus to distinguish this amount of creep in a 1-inch piece of steel in 15 minutes. p. 34

PIG IRON AND STEEL production for the British Isles in January hiked 6 per cent over the December rate. p. 56

NRA CODES deserve at least a fair trial before any of the proposed radical changes are incorporated in them. p. 20

DIE STEELS used in die casting operations are subjected to constant strains from temperature and pressure effects of the cast metal, and room for improvement exists in the resistivity of these steels. p. 23

TO THE DEPTHS of the ocean goes steel in the form of huge caissons for piers supporting the San Francisco-Oakland bridge. p. 26

BAKING OVENS in wire and rod mills may be operated more economically by use of an air heater which automatically regulates atmosphere in the oven and permits direct firing. p. 30

PICKLING TANKS have been made of a variety of materials, newest of which is acid-resisting synthetic resin, phenol-formaldehyde plastic. p. 29

NRA Code Conference May Be Crucial for Vital Issues

A NEW era in the relationship of industry and government begins March 5, a year and a day after the inauguration of President Roosevelt and the start of the "new deal," when representatives from almost 300 codified industries assemble in Washington at the call of NRA Administrator Johnson.

In calling the conference, General Johnson outlined the major purposes as "the consideration in public sessions of the possibilities of increasing employment; protections against destructive competition and against excessive prices and monopolistic tendencies; the elimination of inequalities and inconsistencies in codes; the position of small enterprises; and the vast problem of code administration and the organization of industry for self-government."

For steel, a number of important issues are likely to arise as the conference progresses from generalities to details, these issues including open prices, elimination of the waiting period if open prices are retained, basing points, possible limitation of machine hours, and ability of the industry to absorb more labor through a reduction of the work week to 30 or 32 hours.

A Record Gathering

So far as known, never before have so many industries been assembled for one meeting with the government. The possibilities for regimenting industry even more than has been accomplished under NRA thus far are tremendous.

Whether the temper of the conference is one of co-operation or of further "cracking down" by General Johnson remains to be seen. It is probable that any attempt to shorten the work-week below 40 hours will require considerable "cracking down."

Indicating the scope of the conference, General Johnson has suggested that representatives of code authorities come to Washington prepared to discuss the following topics:

The effect of your code upon operations, including employment, in your industry.

The effect of your code on general price trend of products in your industry.

Effect of your code on unethical practices in your industry.

The effects of code provisions, if any, restricting production through limitation of machine hours or plant facilities.

Effect of code upon the smaller concerns in your industry.

Code provisions which, in your judgment, should be modified or eliminated.

Code provisions which, in your judgment, should be added.

Specific proposals for eliminating overlapping.

Financing of industrial code administration.

President Roosevelt will open the March 5 conference in Constitution Hall. Nearly 7000 members of code authorities and trade association code committees are eligible to attend, and it is expected that the majority will. The President's remarks may prove a milestone in the development of the "new deal."

Following the President's address and also one by General Johnson, the general conference will be divided into several public group meetings to be followed by group conferences of code authorities and committees with the administration and a final general conference of selected delegates of each code authority and committee with the administrator. As now tentatively outlined, the group conferences will discuss the following topics:

Group I. Possibilities of increasing employment; wages and hours; comparative situation of capital goods and consumer goods industries.

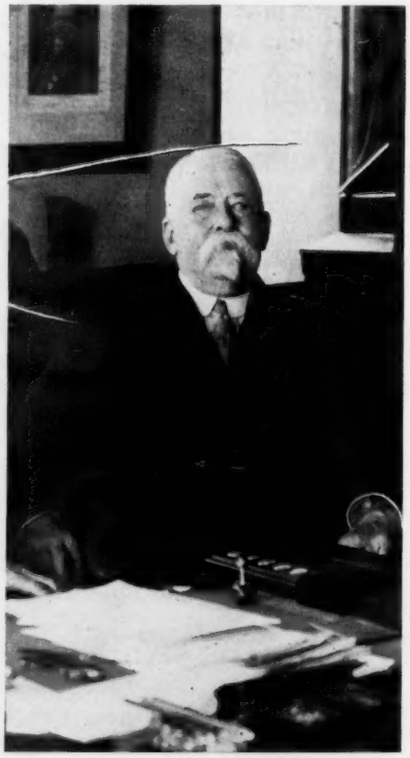
Group II. Trade Practices: Costs and prices; protecting against destructive competition; and against excessive prices and monopolistic tendencies.

Group III. Trade Practices: Control of production; limitation of machine hours; restriction of expansion of facilities; ethical practices regulating competitive relationship.

Group IV. Code Authority Organization: Code administration, including compliance and enforcement; inequalities, inconsistencies and overlapping in codes; interindustry and intercode coordination; the financing of code administration; use and control of the Code Eagle.

Group V. Operation of codes in small enterprises; position of minorities.

A preliminary conference has been called for Tuesday, Feb. 27, in Washington, to develop the agenda more clearly. Code authorities are invited to attend.



HE COMPILES STEEL'S HALL OF FAME: Willis L. King, retired vice president of Jones & Laughlin Steel Corp., who has witnessed the parade of iron and steel executives for 64 years, lists the late Judge E. H. Gary, chairman of the United States Steel Corp., as the greatest of them all. But not far behind he ranks B. F. Jones, Charles M. Schwab and James A. Farrell. Though retired, Mr. King remains a director of Jones & Laughlin

U. S. Steel Corp.

A RAILROAD research bureau to engage in development work for the benefit of the railroad industry and its suppliers has been organized by subsidiary manufacturing companies of the United States Steel Corp.

John A. Ralston has been made manager of the bureau, with headquarters in the Frick building, Pittsburgh.

A series of high tensile steels is being produced and offered to the trade by the subsidiaries co-operating with this bureau. Grades and products suitable for a variety of requirements are available for the execution of new designs having as their purpose a reduction in weight without attendant sacrifice of strength. Consumers are invited to consult with the bureau.

Institute

A REPRESENTATIVE of steelmakers was understood to be conferring last week with NRA authorities in regard to a new schedule of prices for the second quarter. This was preliminary to filing the schedules with the American Iron and Steel institute, the code authority for the industry.

Unofficially, it was reported that the proposed price for billets was $28, Pittsburgh, an advance of $2 per ton. A $10 conversion spread for hot-rolled strip would make that product 1.90c, Pittsburgh, up $3, and a $14 spread for cold-rolled strip over hot would make cold strip 2.60c, an increase of $4.

Also unofficially, sheet bars would be put up $3 to $29. A $21 spread would make black sheets 2.50c, up $5 a ton, and a $33 spread for full

finished sheets make that market 3.10c, up $7.

¶Prices which were recently filed with the American Iron and Steel institute include $21.50, Pittsburgh, on specially heat-treated light-weight freight car wheels, 33 inch tread diameter, with nominal bored weight of 610 pounds, effective Feb. 12.

¶Sellers of sheet and strip seconds have withdrawn prices on washer scrap and end shearings.

¶Effective Feb. 13, 7.50c, Pittsburgh, was filed on hot rolled carbon sheet steel, with carbon content 0.75 to 0.95, phosphorus 0.025 maximum and sulphur 0.025 maximum.

¶Steel plate seconds are 1.25c, base, Birmingham, Ala., effective Feb. 8, with 10 cents up for assortment to gage. (STEEL Feb. 12, p. 12)

¶The price of 1.65c, base, Chicago, for rail steel strip was made effective Feb. 18 instead of Feb. 8 as originally announced.

¶A producer of ingot iron sheets filed prices at Gary and Cleveland on a number of classifications. Heretofore, it is understood, the company had sold on a Pittsburgh basis.

¶Basic iron at Neville Island, Pa., has been reduced 50 cents a ton, effective Feb. 25 to meet a local competitive situation.

¶Recent reductions in the price of stainless steel apply only to three grades of strip instead of to practically all stainless lines as indicated in STEEL for Feb. 12, p. 12.

New Capacity

YOUNGSTOWN SHEET & TUBE CO. has authorized construction of a 42-inch Steckel hot-strip mill at its Indiana Harbor, Ind., works, the first hot mill of this type to be installed by an American steelmaker.

Slabs will be broken down to a thickness of about 1 inch on a 20 x 88-inch universal mill and the resultant plate, without being reheated, will be rolled to 12 gage on the Steckel mill. The latter includes only one stand of 4-high rolls, this being served by two elevated holding furnaces, one spanning the approach table and the other the runout table.

As the strip emerges from the rolls it enters the holding furnace and is reeled into a coil while reduction of the remaining section continues. When the mill is reversed, conditions are duplicated on the opposite side. The hot mill will have a capacity of 20,000 tons a month. Hot strip from this mill will be rolled to black plate gages for tinning on a 4-high cold mill completed in 1933.

¶Steel & Tubes Inc., subsidiary of the Republic Steel Corp., will immediately begin construction of an addition to its plant in Cleveland, to cost $350,000. The company's facilities for the manufacture of boiler tubing will be enlarged.

¶Beyond confirming a Weirton, W. Va., newspaper story that as soon as labor trouble was ended a start would be made on a steel fabricating plant employing 500 men, officials of the National Steel Corp. and its subsidiary, the Weirton Steel Co., would not comment.

Washington

FEDERAL trade commission issued formal order directing the Vanadium-Alloys Steel Co., Latrobe, Pa., to relinquish the capital stock of the Colonial Steel Co., Pittsburgh, giving effect to its announcement Jan. 15 that the stock had been acquired in violation of the Clayton act and tended to substantially lessen competition. Six months is given in which to complete the divestment, which is not to be made to any stockholder, officer, employe or any affiliated interest.

Transportation

FOLLOWING a meeting Feb. 15 at Pittsburgh of leading traffic executives in the steel industry, a proposal is being considered for docketing a public hearing to be held at Pittsburgh in the near future to include steel sheets in the fabricated-in-transit clause in railroad freight tariffs.

¶Just one step ahead of the frigid weather of ten days ago that blanketed the country, Carnegie Steel Co.'s one hundredth steel tow in charge of the I. LAMONT HUGHES luckily escaped being frozen in the Ohio river. The tow left Pittsburgh, Jan. 25 (see STEEL, Feb. 5, p. 13) and attracted large crowds throughout the Ohio valley. The tow arrived in New Orleans, Feb. 14, a few days too late to participate in the Mardi Gras celebration.

Canada

HOPES that a large tin plate industry would be established in Canada as a result of Richard Thomas & Co., large Welsh interest, setting up tinning equipment in the Dominion Alloy Steel Corp. plant at Sarnia, Ont., have been dimmed.

Last week Richard Thomas & Co. obtained a repeat order for 1,000,000 base boxes of tin plate for Canada, the order to be executed at its South Wales works, and obtained in the face of stiff American competition and the cheaper American dollar. As a result the importance of the Sarnia plant is being questioned in Canada.

NRA

A TOTAL of 278 codes covering approximately 90 per cent of all industry and trade has been approved and 353, most of them for relatively small industries, on which public hearings have been held, are nearing final approval.

¶Codes approved last week include railway car appliances, effective Feb. 19; gray iron industry, effective Feb. 26; saw and steel products, Feb. 20.

¶An executive order by NRA Administrator Johnson forbids former executives or employes of NRA to serve on code authorities except as government members to represent industries before NRA, or even to communicate in any way with NRA. The only exemption is for persons who having left their own businesses temporarily to serve NRA return to it and appear later on behalf of their industry.

¶Regulations requiring employers operating under approved codes to post the labor provisions of these codes conspicuously have been promulgated by NRA.

¶Hearing set for Feb. 21 on the code for the corrugated rolled metal

STEEL AND IRON, WELDED, FOR SERVICE: This craft, with hull of rust-proof iron and upper works of steel, all electric arc welded, has speed of 15 miles per hour. It is used for service by Dunbar & Sullivan Dredging Co., Detroit. It was built by Hans Hansen Welding Co., Toledo, O.

culvert pipe industry has been postponed to March 2.

¶Foundry Equipment Manufacturers association, whose code became effective Feb. 17, has elected John D. Wise secretary and treasurer of its code authority as well as executive secretary of the association, with headquarters at 1213 West Third street, Cleveland. On the code authority are Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md.; E. O. Beardsley, Beardsley & Piper Co., Chicago; F. R. Wallace, Tabor Mfg. Co., Philadelphia; R. S. Hammond, Whiting Corp., Chicago; V. E. Minich, American Foundry Equipment Co., Mishawaka, Ind.; Edward A. Pridmore, International Molding Machine Co., Chicago; Don A. Weber, Deister Concentrator Co., Fort Wayne, Ind.; H. S. Simpson, National Engineering Co., Chicago, and S. C. Vessy, W. W. Sly Mfg. Co., Cleveland. One member will be elected by nonmembers of the association. Mr. Vessy was elected chairman, and Mr. Beardsley vice chairman.

PWA

PWA Administrator Ickes last week halted submission of new nonfederal projects and directed his administration to concentrate its effort on converting work already provided for into labor and materials.

¶Allotments totaling $2,450,208 for construction of 46 small nonfederal projects which will create 26,711 man-months of direct employment were made last week by PWA. These include waterworks at Cleveland, Okla.; Humble, Hallettsville, Leonard, University Park, and Richmond, all of Texas; Buffalo, Wyo.; Wells, N. Y.; Buhl, Minn.; Wisconsin Dells, Wis.; Gallatin, Tenn.; Worcester, Mass.; and Ramsey, Ill.

¶Progress made on emergency construction of highways to Feb. 10 includes a total of 5955 projects estimated to cost $306,562,000. Projects under construction on Feb. 10 total 3470.

Labor

ORGANIZED labor tried last week to put the Republic Steel Corp. "on the spot." The charge was made to the national labor board by representatives of the mines, mill and smelters workers union that Republic was fostering a company union at its Birmingham, Ala., plant.

In reply, Thomas F. Veach, counsel for Republic, testified: "Our position is that of the steel industry generally and we will take such steps as is lawfully necessary to uphold the employes representative plan."

¶No public clash last week marked the progress of the attempt of the national labor board to adjust the labor situation in the various plants of the Weirton Steel Co., Weirton, W. Va. The company having refused to furnish the board with a payroll list for the purpose of polling employes, the board announced that it would proceed on its own initiative to ascertain if a substantial number of Weirton employes desire an election. The company is standing upon the results of the Dec. 15 election, when an overwhelming majority voted for employe representatives.

¶Results of the recent election at the Searight coal mine of the Republic Steel Corp. were announced by the national labor board as 201 for the United Mine Workers and 61 for the company brotherhood.

¶An eastern steelworks, short of experienced melters and first helpers, was recently compelled to take off an open-hearth furnace for six days in order to meet the steel code's limitation of 40 hours for labor.

¶Swann Corp., Anniston, Ala., has gone on a 36-hour week, increasing wage rates sufficient to compensate for the reduction in hours. Manufacturing acids and abrasives, the corporation claims to be the first in the United States to adopt a 36-hour week.

¶General Electric Co. has paid more than $10,000,000 to employes and families of employes in death and disability benefits under group life insurance plans. At present, 47,000 employes are insured for a total of $140,000,000, of which $60,000,000 is paid for by the company.

They Say:

PRESENT rapid improvement in the machine tool industry may prove to be the beginning of a resumption of activity in other lines of durable goods, which so far have shown only small advances. Automobile activity, rail equipment orders, and the general industrial pickup along the Atlantic seaboard are now being backed up by suddenly improved sentiment and substantially increased purchasing power in the Middle West, South, Southwest and Pacific coast."—C. S. Stilwell, sales manager, Warner & Swasey Co., Cleveland.

¶"During the past two years the metal house has made rapid strides. Should it continue to progress, it will mean a wedding of steel and ceramics, and strong, enduring metal houses with brick, porcelain enamel and other ceramic exteriors, will be a common sight in every county and state in America."—Bennett Chapple, vice president, American Rolling Mill Co.

Financial

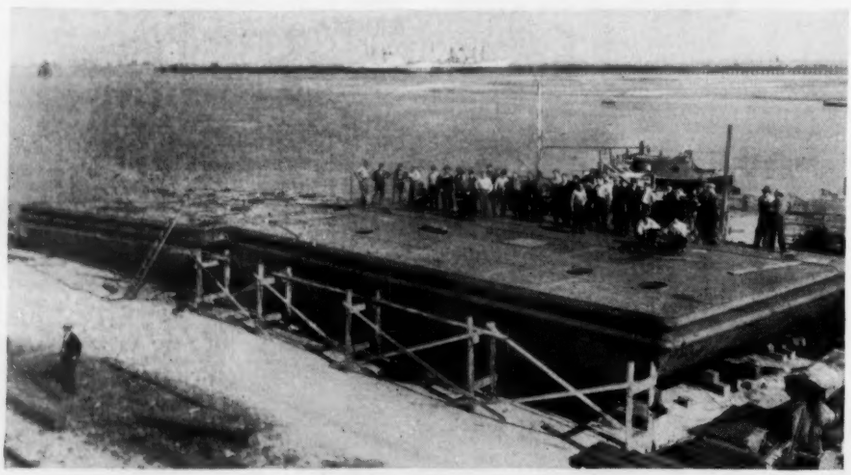
ALLEGHENY STEEL CO., Brackenridge, Pa., reports net profit of $292,017 in 1933, after federal taxes and depreciation, against net loss of $1,052,080 in 1932.

¶McKeesport Tin Plate Co., Pittsburgh, has declared the regular quarterly dividend of $1 payable April 2 to March 15 record.

¶Chicago Railway Equipment Co., Chicago, had net loss of $115,935 in 1933, compared with losses of $380,371 in 1932 and $379,800 in 1931.

¶Chicago Flexible Shaft Co., Chicago, reported net profit of $189,515 after charges for 1933, compared with profit of $92,759 in 1932.

¶Interlake Iron Corp., Chicago, reports a consolidated net loss of $817,331 in 1933, after charges, compared with net loss of $2,169,887 in 1932. The company last year took a profit of $230,878 on purchase of its bonds for



WELDING SPEEDS UP BARGE CONSTRUCTION: Two, 60 feet long, 30 feet wide and 6 feet deep, were built recently by 40 men in two weeks for the United Dredging Co., New York, by the Kane Boiler Works, Galveston. This is believed to be a record in barge building. All welding was done by the shielded arc process, using electrodes and machines manufactured by the Lincoln Electric Co., Cleveland. Upon completion the barges were tested, without a leak appearing

sinking fund purposes. A similar profit in 1932 totaled $70,059.

Superior Steel Corp., Pittsburgh, had net loss of $254,939 for 1933 against net loss of $600,273 in 1932. Net loss in the December quarter was $31,217, compared with net income of $23,387 in the third quarter.

Operations

OTEWORTHY improvement in the Pittsburgh, eastern Pennsylvania, Chicago, Youngstown, Cleveland, and Buffalo districts lifted the steelmaking rate last week 4 points to 43 per cent, highest since the first week of September.

With Pittsburgh, Chicago and Youngstown mills scheduling increases for this week, further improvement is in sight. Operations in the Wheeling, New England, Birmingham and Detroit districts are steady.

Youngstown: Improved 1 point to 45 per cent last week and expected to reach 50 per cent this week as steel buying continues strong. Carnegie and Republic each have lighted three open hearths. Out of 83 independent open hearths, 45 are now operating.

STEEL CORPORATION SHIPMENTS

(Tons)

	1934	1933	1932	1931
Jan.	331,777	285,138	426,271	800,031
Feb.	.....	275,929	413,001	762,522
March	.....	256,793	388,579	907,251
April	.....	335,321	395,091	878,558
May	.....	455,302	338,202	764,178
June	.....	603,937	324,746	653,104
July	.....	701,322	272,448	593,900
Aug.	.....	668,155	291,688	573,372
Sept.	.....	575,161	316,019	486,928
Oct.	.....	572,897	310,007	476,032
Nov.	.....	430,358	275,594	435,697
Dec.	.....	600,639	227,576	351,211
Less yrl. adj.	.....	.....	5,160	6,040
Tot.	.....	5,760,952	3,974,062	7,676,744

Finishing mills will be rolling this week at the heaviest rate in four years. The valley is now talking of a 60 per cent rate by April 1.

Chicago — A fractional increase raised the rate to about 38 per cent. Increased specifications point to an early improvement in schedules. Blast furnace operations hold at 9 active steelworks stacks out of 36.

Cleveland-Lorain: Up 4 points to 79 per cent, National Tube Co., Lorain, lighting two more open hearths, operating 10; Corrigan, McKinney Steel Co. continuing with 13, and Otis Steel Co. with eight. Otis also is operating two 35-ton open hearths at its Lakeside (Cleveland) plant. These schedules will continue through this week.

Central eastern seaboard: Up 3 points to 27 to 28 per cent, the im-

(*Please turn to Page* 55)

Weir Stresses Responsibilities Of Capital, Labor, Government

SPEAKING on "New Industrial Responsibilities" before the regional meeting of Catholic conference on industrial problems, Ernest T. Weir, chairman of the board of National Steel Corp., Pittsburgh, discussed briefly four of these responsibilities: Responsibility of management to labor, responsibility of management to capital, responsibility of labor leaders to labor and responsibility of government to labor.

In part, Mr. Weir said:

"Aside from the responsibility management has, a grave responsibility also rests upon the leaders of labor. The labor leader who advocates unsound demands and uneconomic theories does serious injustice to the men he so incites and to our general industrial advancement.

"I have been a steelmaker for 43 years. I began when most of the heavy work was done by hand. I have seen the machines come into the steel mills. For 43 years I have seen men shaking their fists at these machines. Eight times I have seen the country sink into some sort of depression and each time men have risen to announce that we have ridden into the slump on our machines. I deny this.

Would Scrap Continuous Mills

"I have seen machines put men out of work by hundreds and then hire them back by thousands. Only the other day, according to the newspapers, the Amalgamated Association of Iron, Steel and Tin Workers proposed that the government appropriate $150,000,000 to purchase and scrap continuous mills because it was asserted that those mills resulted in a reduction of labor.

"In my opinion there is no responsible leader of labor in this country who does not know full well that nothing can be accomplished in the long-run by trying to stifle our economic advancement in order to create more hand-labor, and yet many of these men appeal to their followers on such a basis merely to inflame them and solidify the hold of the leaders upon the men.

"Any man who has the brains, tact and personality to become one of the leaders of union labor has also the intelligence to know that management cannot continue to grant increasing demands of labor unless the selling price of the product will stand the increased cost. Labor leaders know this fact and yet they often agitate and foment unreasonable demands merely for their personal aggrandizement. They even prey upon the supposed lack of intelligence of their followers and appeal to class prejudice.

"It is undoubtedly true that union labor has accomplished much for its workers in some industries. In a business in which manual labor is the chief factor and each man can produce about as much as his neighbor, an organization which puts every man on substantially the same basis may be beneficial to them.

"In the steel industry, a great deal depends upon the intelligence, skill and experience of the individual worker and management must recognize this in the payment of wages. Any organization which tends to put all of those workers on the same basis can accomplish very little good for them.

"I have no quarrel with organized labor as such, but I have a decided opinion regarding the perception and sincerity of many of the labor leaders of today. * * *

Scores Labor Board Policy

"I heartily approve of the provision for collective bargaining granted to employes in section 7*a* of the national industrial recovery act, and also I could cite at some length the details of how Weirton Steel Co.'s employe organization is functioning with more value to workers than national unions. * * *

"As you have undoubtedly noted from the newspapers, our company is having a controversy with the national labor board. I do not think it is a proper tribunal for the determination of labor disputes. I do not intend to go into the merits of the controversy which we are having with the labor board. I do, however, want to paint you one picture to illustrate the functioning of the national labor board.

"The captive mine owners were before the labor board for the determination of a question of vital interest to the industry and to the men. The United Mine Workers of America was one party to the controversy and that organization is affiliated with the American Federation of Labor.

"When the matter came up for hearing before the labor board, William Green, president of the American Federation of Labor, and a member of the labor board, presided. One other member of the labor board was on the bench with him, and the only other member present was John L. Lewis, president of the United Mine Workers of America. Mr. Lewis came down off the bench and argued the case for the United Mine Workers of America.

"When the decision came out, which was naturally against the mine owners, as far as the records show, Mr. Lewis participated in the decision with the others. Is not such a picture revolting to the American sense of justice? No man has the right to be judge and jury in his own

cause. One question involved in that controversy was the check-off, the method by which the union receives compulsorily a part of the worker's earnings.

"Mr. Green and Mr. Lewis each had a financial interest in that controversy, yet one of them was sitting as the presiding judge and the other a member of the court arguing the case for one of the contestants. Is it any wonder that industry rebels against such a tribunal—for in the last analysis every man's sense of fairness asserts itself some time.

"I have firmly supported the national recovery act; I believe in its principles; I have pledged my support to President Roosevelt's recovery program, but I am not going to be carried away by slogans, newspaper tirades, or bombast.

"I believe that the national labor board, as it is constituted, is prejudiced, biased, and unfair to industry; and I shall not hesitate to assert my position on the matter.

"Nothing is gained in the long-run by silence about so vital a matter; and one of the glories of American freedom is the right of each man to express himself on the agencies of government.

Unbiased Opinion Needed

"Those who drafted our Constitution realized the importance of an independent judiciary. Every federal judge from the lowest to the highest is appointed for life. The purpose of the framers of the Constitution was to give to the federal government a judiciary absolutely free from prejudice, bias, personal or political motives.

"If the government is to establish a tribunal to determine labor controversies it ought to be free from every political consideration. If the national labor board is to be regarded as a court with the right to sit in judgment upon controversies between employers and employes, it should be composed of men possessing the same freedom from influence as federal judges now possesses and have always possessed.

"The installation of officers of national labor unions upon such a tribunal, or political aspirants, will never appeal to the traditional American sense of justice; and the position of the steel industry and other industries in objecting to such a tribunal as now constituted will be ultimately recognized as being sound and in accordance with American so necessary to the process of national recovery.

"The national labor board, as now constituted, will never promote industrial peace or harmony which is so necessary to national recovery.

"The solution of our problems—industrial, economic, and political, can only come through peaceful consideration.

"Now that employe and employer relations seem destined to be governed by law, government must be willing to accept the responsibilities that go with it and see to it that the tribunals established for the determination of questions between labor and capital are fair and just; otherwise, no permanent success can be achieved.

"We, in common with the balance of the world, have suffered terribly from the horrors of war and its aftereffects. It is my earnest hope that the solutions to our present difficulties, which have affected us all so greatly, should come through peaceful considerations; for only in this manner can individual interests be protected and advanced to that degree of prosperity that is the aim and ambition of every true American."

Coast Steel Men For Open Prices

DEL MONTE, CALIF.

RETENTION of open-price provisions of NRA codes was favored at the tenth annual conference of the iron, steel and allied industries of California, held at Del Monte, Feb. 8-10, other resolutions favoring enactment of federal legislation on interstate motor transportation and a thorough study of unemployment insurance.

Of strictly local interest, the conference urged the abolishment of the 2½ per cent California sales tax on certain iron and steel products manufactured in the state.

E. Jungquist, of the Percival Steel & Supply Co., Los Angeles, was again elected chairman of the conference. W. W. Glosser, of Hubbard & Co., Emeryville, Calif., was re-elected vice chairman, and Charles S. Knight, of the California state chamber of commerce, secretary. Chairmen of various groups also were reappointed.

Harmony Must Prevail

W. A. Irvin, president, United States Steel Corp., said that not only the Steel corporation but also the entire steel industry was united in support of the President. Continuing he said:

"It is clear that if the steel industry is expected to increase employment and to maintain the level of wages now in effect, more stability of markets must take the place of destructive conditions created by cutthroat competition of the past. The problem of whether codes are to stand or fall depends upon whether or not they work harmoniously to the best interests of all concerned—labor, industry, and the public.

"The experience in rational self-government gained under the steel code has given leaders in the industry a fuller understanding and appreciation of their social responsibility, which they fully recognize and accept."

Mr. Irvin stated that the steel industry knows that it must have a fair and liberal labor policy and that if prices are increased to an unreasonable point which would result in unreasonable profits, the very purpose of the recovery act would be defeated.

In addition, Mr. Irvin pointed out that the future possibilities of industrial development in California and on the Pacific Coast have never been brighter. Since 1930, when the Steel corporation took over the Columbia Steel Co., he said, "We have spent over $3,000,000 in expanding our Torrance and Pittsburg, Calif., plants, and the present capacity is now over 260,000 tons annually. During 1933 Columbia spent approximately $5,000,000 on payrolls, while the total amount of money involved in the purchase of raw materials and in transportation charges exceeded $7,000,000."

The importance of the meeting this year to the leading iron and steel executives throughout California was evidenced when more than 200 delegates, one of the largest gatherings on record, attended the opening session on Feb. 8.

Employment Nears 1931 Level

The conference was brought to order by Mr. Jungquist, chairman. In reviewing the activities and developments in the industry during 1933 he stated that employment showed an average increase of 6½ per cent during 1933, over the preceding year and that during the last three months of 1933 the employment level, as regards the steel industry, rose approximately to the 1931 total of 50,000 people.

"Price increases," he said, "ranged from 9 to 22 per cent; and pig iron from 9 to 10 per cent." These figures were based, Mr. Jungquist stated, on a statewide survey recently completed by the research department of the California state chamber of commerce, under whose auspices all the steel conferences in the past have been held.

In his address, Joseph V. Smith, vice president, Hubbard & Co., said that industry's outstanding problem is "to advance commodity prices from a ridiculously low point to a point where reasonable profit might be expected. The same consideration which has been given wage earners and consumers must be extended to the industrialist and the merchant if recovery is to be made complete."

Group meetings of fabricators, reinforcing steel bar jobbers, merchant steel bar jobbers, foundries, general manufacturers, steel mills, purchasing agents, traffic agents and tubular distributors were held on the evening on Feb. 8.

The address of V. G. Iden, acting secretary of the American Institute of Steel Construction, New York, was reported in STEEL for Feb. 12, p. 16.

WINDOWS OF WASHINGTON

WASHINGTON

AS SOON as the Russian bear is thawed out by the new RFC export-import bank, which should not be long, Washington expects inquiries for equipment requiring heavy tonnages of iron and steel to be issued by Soviet authorities.

Chiefly because of rumors of impending war in the Far East, speculation concerning prospective Russian business has centered on track material and rolling stock, but in the past week oil country goods and refinery equipment have come to the front.

Apparently, Soviet authorities propose to offer petroleum products in world markets as the means of raising cash to finance other foreign purchases. Washington is pleased at this apparent shift in Soviet policy, inasmuch as rail mills and car builders are booking substantial business, whereas pipe mills and makers of refinery equipment have been almost as dormant as the investment dollar.

At least one large plate fabricator is understood to be negotiating with Soviet authorities. Presumably, the Amtorg Trading Corp., 261 Fifth avenue, New York, will be the clearing house for Soviet purchases, although separate missions—of which some are now in the United States—may participate.

There are strong reports that the first Russian order will be for 40,000 tons of pipe for a line into Siberia from the Lake Baikal district. Leading mills are said to have the inquiry. This order would require almost half the bank's capital.

The extent to which rail mills will benefit from Russian business is problematical. This year, Soviet mills are scheduled to roll 550,000 tons, but estimates of requirements for double tracking the Trans-Siberian line, laying heavier rails on secondary lines, lengthening sidings etc., run as high as 2,000,000 tons.

At present, Polish mills have the inside track for the rails, most of which are 110-pound sections. European makers likewise are expected to have the inside track on fastenings. Generally speaking, the less-fabricated products are expected to be bought in Europe, with the United States' opportunity in fabricated and finished materials. Whether tie plates will be used on the 20,000,000 ties that are to be replaced is not known.

For rolling stock, the Soviet 1934 program totals $200,000,000. New equipment which Soviet plants are scheduled to make includes 38,000 freight cars, 1250 steam, 40 electric and 20 diesel locomotives.

According to the bureau of foreign and domestic commerce, Washington, some 50,000 freight cars will undergo capital repairs this year at six new car shops, which, it is assumed, are a market for machinery. Automatic couplers will be installed on 10,000 cars, automatic brakes on a third of all equipment as rapidly as possible, block signals are planned for long stretches of line.

Not only will equipment be needed for this rolling stock program, but the Soviet programs also lists establishment of plants for manufacturing radial drills, gear cutting machines, grinders, automatic and heavy duty lathe plants, and a ball bearing plant —outlets for production equipment on a large scale. It is also reported that gasoline engines for tractors and passenger cars will be placed.

Up to this time no definite word has emanated from any Soviet authority, and probably none will until financing, which is the key to Russian business, is arranged. The new export-import bank will have a capital of $11,000,000 at the outset and confine itself entirely to Russian business.

Unofficially, it is understood that the bank will either discount or indorse or guarantee Soviet paper. Possibly as high as 70 per cent of purchases will be guaranteed. Russia is on the blacklist of defaulting debtors of the United States, but in the case of cotton sales this hurdle was negotiated by RFC loans to exporters themselves, who gave back Soviet paper. Russia has been slow to pay at times, but has not defaulted on any commercial obligations.

Keeping the new bank single-minded on Russia may be a problem. Colombia, with whom a commercial treaty has been negotiated, could use RFC funds for purchasing American farm implements. An eastern wire rope and cable maker is probing the South American market for bridge materials. Australia and South Afri-

Scrap Continuous Mills To Aid Labor—Amalgamated

IF PLOWING under crops and levying a processing tax are a legitimate means for relieving the farmer, scrapping the labor-saving continuous mills and taxing the remaining sheet steel production would be the equivalent "new deal" for unemployed sheet workers.

So reasoned 200 delegates representing 42 local unions of the Amalgamated Association of Iron, Steel and Tin Workers at their recent meeting in Warren, O.

According to Amalgamated figures, 1600 workmen operating the 12 continuous sheet mills in the United States can produce as much tonnage in a year as 32,000 men at the 636 hand sheet mills, many of which are now idle. The same number of men required to roll 400 to 600 tons a day on a continuous mill can make only 25 tons daily on hand mills.

This prompts the Amalgamated to propose that the government spend $150,000,000 buying up and scrapping all continuous mills. Amalgamated members are willing to contribute 3 per cent of their wages, while a tax of about 3½ per cent on hand mill sheet production, supposing sheets to average $60 a ton and production 5,000,000 tons a year, would amortize the $150,000,000 in 11 years.

ca would buy some American steel products if they could be financed.

REGARDLESS of whether or not Russian business in track material crosses the Atlantic, PWA loans are slowly but surely maturing domestic business. A score of roads either have just placed or are inquiring for track fastenings, including special track work, aggregating 205,000 tons. These roads are:

Atchison, Atlantic Coast Line, Bangor & Aroostook, Boston & Maine, Central of Georgia, Central of Vermont, Chicago & Eastern Illinois, Chicago & Western Indiana, Chicago & Illinois Midland, Chicago & North Western, Burlington, Milwaukee, Rock Island, Delaware & Hudson, Lackawanna, Great Northern, Illinois Central, Lehigh & New England, Sioux line, Missouri, Kansas & Texas, Missouri Pacific, New Haven, Northern Pacific, Pennsylvania, Frisco, Southern Pacific, Tennessee Central, Wabash, and Western Pacific.

Practically all of these carriers also either have recently purchased rails or have set the machinery in motion. While a stickler for the "reasonable security" which the recovery act specifies, the railroad section of PWA and the railroad co-ordinator are expediting loan arrangements in order to throw as much business as possible to mills between March 1 and June 1.

Incidentally, the 100,000 tons of rails for which the Pennsylvania is now providing PWA financing was distributed sometime ago, and hence is not new business.

As an example of the railroads' contribution to recovery from the depression of 1921, during the 1919-21 period they ordered 2451 locomotives and 129,615 freight cars. In 1922, the year after the depression ended, they made commitments for 2600 locomotives and 180,154 freight cars.

By comparison, during 1930-32 the same carriers placed 687 locomotives and 59,208 freight cars. In 1933, only 2460 freight cars were bought.

A SURPRISING number of "old deal" animosities against steel are being revived by the "new deal."

Most important, probably, is the resuscitation of the basing point matter, thought finally disposed of a decade ago when the federal trade commission concluded the Pittsburgh-plus case.

Under the Borah resolution, investigators for the commission last week were scanning minutes of American Iron and Steel institute committee meetings in Pittsburgh and New York, preliminary to the report which is to go to the senate in a week or ten days.

The present temper of the commission is that iron and steel must be sold at the point of production. Amputation of the basing point provisions of the steel code, which is Senator Borah's objective, would junk the pricing machinery that has been years in building, and would give the consumer as well as the producer something to think about.

Thus far it has been a duet of Senators Borah and Nye against steel, but last week Senator Shipstead, of Minnesota, made it a trio. In a vitriolic attack upon the industry he rattled the bones of the Steel corporation dissolution suit, the Gary dinners, Pittsburgh-plus, and over-capitalization. It is fortunate for steel that the *Congressional Record* is not widely read.

Incidentally, an economist of great note is suspicious that steel stocks today still contain a high degree of water which, if squeezed out, would make present prices and volume remunerative. Nothing in a legislative way is in sight on this point, but it evidences the way radicals are thinking.

The Vinson bill providing for the construction of an aircraft carrier of 15,000 tons displacement, 99,200 tons of destroyers and 35,530 tons of submarines looks like tonnage for steel, but there is a stinger in the next to last section.

This limits profits on these ships and materials used in them to 10 per cent—a rate any shipbuilder or steelmaker or equipment manufacturer would be pleased to net—but also provides that all books, records, etc. of every contractor be open for inspection by either the senate or house at any time.

Last week Secretary of Labor Perkins assembled representatives of 43 states for the purpose of exchanging views on labor legislation preliminary to enactment of uniform laws. At the same time, NRA was urging a model state code putting teeth into the blue eagle in intra as well as interstate business.

Old age pensions, unemployment reserves, child labor, regulation of home work, safety and health protection were among the topics. In the near future steel, among other employers, will be invited to a similar conference. The matter of unemployment reserves has reached the point where the Wagner bill, which would require payment of 5 per cent of gross payrolls into a pool, is being seriously considered in the senate.

Meanwhile, NRA Administrator Johnson is outlining his town meeting of NRA code authorities beginning March 5, with industry likely to be offered the chance of voluntarily accepting a 32-hour week in preference to having a 30-hour week forced on it. General Johnson became ill late last week.

Thus, the picture for steel doesn't look so good. It will take real pressure from the industry to prevent basing points and open prices being knocked out of the code. This would leave the industry with practically no benefits from NRA but with a short work week and higher wage rates prescribed, adding millions to cost with few offsets.

REVERTING to Russia, the matter of patents becomes important as the prospects for the resumption of trading on a large scale brighten. Government information on Russian patents is meager, but a New York attorney—Arthur Middleton—has made a study and states:

"Russia has a patent system. It is an arbitrary one, nevertheless, in five years the number of patents issued has increased 500 per cent. And yet, as no suit for patent infringement has been brought into court, no one can tell what will happen. In other words, no one knows whether Russian patents are sustainable or not.

"A Russian patent costs about $200. After it is obtained, a tax must be paid on it annually to keep it alive. These taxes increase progressively so that to maintain a patent for its full term of 15 years, will cost over $2000 in addition to the initial cost of obtaining it.

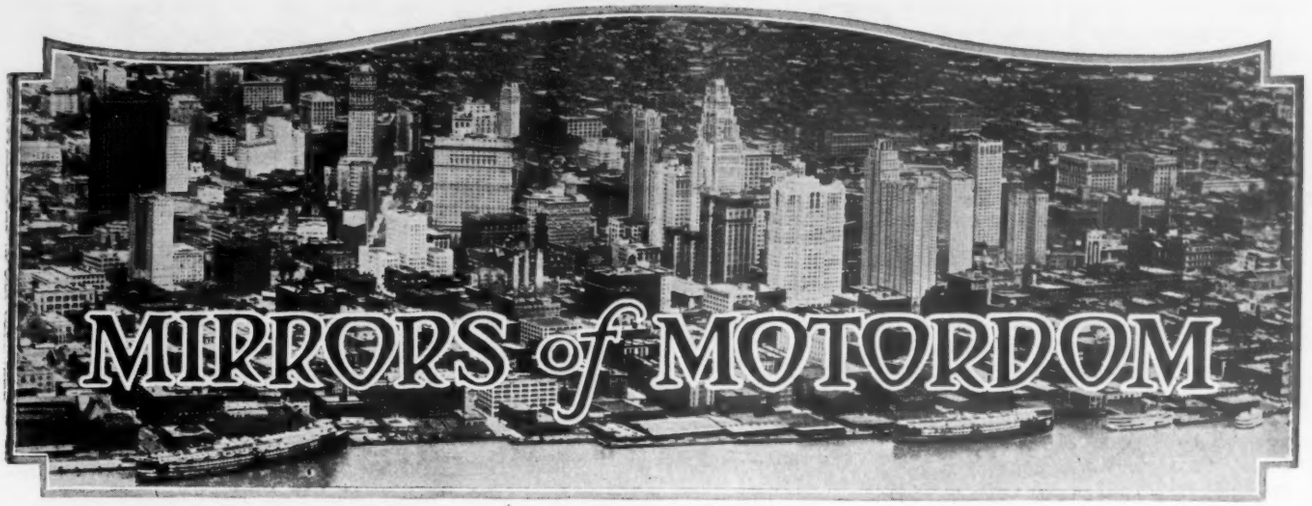
"Since a manufacturer rarely has only one patent but depends upon a group of them to adequately protect his business, this cost must be multiplied by the number of patents which he has. Thus, patent protection in Russia represents a considerable investment to him and consequently he must sell quite a number of machines in order to make that patent expenditure profitable.

"Thus far the Russians have given preference in their purchases as between two sellers to the one having Russian patents. This has tended to stimulate the applying for such patents but the whole matter of their recognition by the soviet government is so uncertain as to leave the American seller most uncertain as to what to do about it.

"The Russians have faithfully lived up to their financial obligations. Perhaps in the future they may also live up to their patent obligations although it is believed that they have not done so uniformly in the past.

"So it seems very important that in arranging for any credits for the Russians with which to buy American goods, some understanding should be reached as to their view of the sanctity of their patents granted to Americans."

A TEST case will be rushed through the courts to determine the power of the housing corporation to condemn property for slum clearance. Out of 21 projects, only 8 have raised required local capital. Pipe and hardware will benefit if the program goes through. . . . The country's reaction to cancellation of airmail contracts has been more unfavorable to the administration than on any other major policy. The feeling is that, conceding abuses, the innocent of an important and growing industry have been tarred with the same stick as the guilty.



Streamline Design Spreads
Ford Plans Radical Series
Steel Prices Down, Autos Up

DETROIT

WHEN it introduced its revolutionary Chrysler and DeSoto series at the New York show the Chrysler organization was virtually betting that the transition to radical streamlining could be effected in one model year.

Other manufacturers, while privately conceding that Chrysler was on the right track, were in effect betting that it would take the public two to three years to get accustomed to automobiles that were blunt at both ends and looked the same coming or going.

Only this week are deliveries of Chrysler and DeSoto being started on a volume basis, some dealers getting as many as six a day, and practically none is yet to be seen in traffic, but it appears that the jackpot goes to Chrysler.

Ford is embarking on the preliminary work of a streamline job, not wholly unlike the "dream car" Briggs displayed at the Ford industrial expositions in Detroit and New York last fall, pictured in STEEL for Oct. 30, p. 11.

Buick is shrouding its new small car, originally planned for presentation to the public about March 1, with unusual secrecy, but this model will not be much more conservative than Chrysler or DeSoto.

Fisher Body, buying steel for sample bodies for 1935 models, indicates that it will almost close the gap between General Motors design and Chrysler, though of course sample cars are far from certain indicators of the final decision.

It is too early even to give a hint as to the place of the streamline job in the Ford line. The speculation is that the new series would supplement rather than supplant the present one, for considerable Ford business is done with buyers congenitally conservative.

There is also some speculation whether a streamline car would give Ford the opportunity to use the small but extremely powerful and economical engine he has developed for a V-8 line priced lower than the present one.

In view of the overnight decisions and changes made at Fordson, any guess on Ford policies is hazardous, but it can be accepted as accurate that Ford has something radical on the boards. Meanwhile, Ford is assembling about 4000 units a day, leading the entire procession, and with practically no new dies to junk or costs to write off if he decides to go streamline.

Some fender and body dies delivered to the Buick plant at Flint recently indicate a semi if not a full streamline design. In many respects, these dies are similar to those made for the new Chrysler and DeSoto.

In wheelbase, the new Buick will be a little shorter than DeSoto but the body will be long for the wheelbase, somewhat similar to the smaller Studebaker.

Sentiment in Detroit is pretty well divided between the big three—General Motors, Chrysler and Ford—but there is a surprising unanimity of opinion that Chrysler has stolen a march on the industry.

AUTOMOBILE manufacturers are in one of those rare eras where production practically doubles each month.

December assemblies in the United States totaled 84,045 units. January official statistics are not yet available, but estimates of 150,000 to 165,000 units show almost a 100 per cent increase.

February probably will fall short of 300,000 units, but by only a small margin. March apparently will show further improvement, to well over 300,000 units, but obviously will end the doubling period.

Ford, as previously noted, is holding at about 4000 units a day. Chevrolet, gaining momentum rapidly, has crossed 3500 units daily, on the way up, and so far as can be foreseen will push up to more than 5000 a day as rapidly as mechanical conditions permit.

Plymouth has finally pushed above 1000 units a day—though not much—and will not ease its expansion efforts until it hits the 1500-mark.

Hudson-Terraplane is now assembling over 400 units a day, and is about to start a third production line. February shipments exceeded by 2000 the aggregate for February, 1933 and 1932. Hudson has been especially active in adding new dealers, having signed up 200 since Jan. 1.

Willys-Overland will be back in the market, for a short time at least, as a result of court permission to receivers to make 5000 to 7000 cars. However, some surplus equipment at both the Toledo plant and the Wilson foundry division at Pontiac will be sold to satisfy creditors' claims.

Chrysler and DeSoto have scheduled 7800 assemblies of their new streamlined models by March 19. Since the week of Feb. 5, parts for 1000 assemblies weekly have been ordered. Dodge models are dropping off the line at the rate of almost 500 a day now.

Other production schedules on a daily basis are Buick 500, Oldsmobile 300, Studebaker 400, Lincoln and Pierce-Arrow 20 each. Nash's new Lafayette is on a schedule of 100 daily.

The suspicion that, while automobile manufacturers are carping over steel prices they are releasing more than is required for current production, appears to have some foundation. This tendency to stock is believed to be prompted more by fear of labor difficulties in the steel industry than by the possibility of higher prices.

The possibility of a congested steel

industry during the second quarter —a condition that might embolden labor—is also foreseen as the railroads and building increase their takings of steel, plus any foreign orders in case the tinder boxes in Europe and the Far East catch fire.

LEST anyone be misinformed, the hatchet has not yet been buried over the matter of steel prices. Threats of reprisals by automotive buyers are less frequently heard, but the underlying contention that the automobile industry's tonnage requirements merit a differential remains an irritant.

Superficially at least, steelmakers appear more sinned against than sinning. F.o.b. automobile prices are not far behind 1929, while the more important classifications of automobile steel show marked reductions.

During 1929, carbon steel bars ranged from 1.90c to 1.95c, Pittsburgh, while today they are 1.75c. In 1929, autobody sheets were 4.00c to 4.10c, Pittsburgh, plus the full freight of 28½c; today the same grade is 2.75c, Pittsburgh, plus the 20-cent differential for Detroit delivery. Plain wire was 2.40c to 2.50c at Pittsburgh during 1929 or $3 to $5 a ton higher than today.

Following is a comparison of f.o.b. automobile prices. In 1929, of course, Ford was making only a four. Plymouth was a four then and had not acquired volume. Pontiac was a six in 1929. Other comparisons are on an entirely equal basis. The prices listed are those on 4-door sedans:

	1933	1934	1929
Plymouth (6)	$510	$585	$695
Ford (8)	560	585	500
Chevrolet (6)	565	645	675
Dodge (6)	670	745	995
Pontiac (8)	695	785	845
DeSoto (6)	765	995	885
Auburn (8)	775	995	1495
Graham (6)	795	745	955
Olds (6)	825	730	975
Chrysler (6)	845	850	1065
Graham (8)	895	925	1925
Studebaker (6)	915	695	1165
Chrysler (8)	995	1245	1775
Hupmobile (8)	995	1095	1090
Reo (6)	995	845	1395
Buick (8)	1045	1125	1235
Studebaker (8)	1075	945	1695

Amtorg Head in Pittsburgh

Peter A. Bogdanov, head of the Amtorg Trading Corp., the Soviet purchasing organization here, visited Pittsburgh, Feb. 10 and 11, as a guest of Dr. Thomas S. Baker, president of Carnegie Institute of Technology. According to Mr. Bogdanov, his visit was made chiefly to renew business acquaintances.

Wins Diesel Contract

McIntosh & Seymour Corp., Auburn, N. Y., has been awarded contract for diesel propelling equipment for coast guard boats, bidding $460,290 on lot No. 1 and $417,575 on lot No. 2; bids Jan. 15.

Died:

EDWARD B. ELCOCK, 74, president, Hansell-Elcock Co., structural steel fabricator, Chicago, in that city, Feb. 12. Born in Belfast, Ireland, he went to Chicago in 1867, assisted in organizing the Hansell-Elcock Co. in 1888 and became president in 1904.

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Hugh B. Lowden, 61, advertising manager and engineer for the Colorado Iron Works, Denver, in that city, Feb. 5.

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John L. V. Bonney, 58, president and treasurer of the Bonney-Floyd Co., steel castings manufacturer, Columbus, O., Feb. 12.

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Frank L. Scharff, 73, for many years manager of C. C. Bradley & Son Inc., metal specialty manufacturer of Syracuse, N. Y., in that city, recently.

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Robert Cullen, 58, superintendent of the open-hearth department of the Portsmouth, O., works, Wheeling Steel Corp., at his home in Portsmouth, recently.

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Charles H. Sheasley, 70, president and general manager of the Franklin Valveless Engine Co., Franklin, Pa., Feb. 13. He had long been prominent in the oil industry.

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George W. Eckerle, 44, for nine years assistant to the vice president of the Pere Marquette railroad and for a period up until 1925, purchasing agent of the Detroit, Toledo & Ironton railroad, in Detroit, Feb. 4.

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William A. Somers, 80, since 1929 chairman of the board of Somers Fitler & Todd Co., Pittsburgh, manufacturer of mill supplies, in Pittsburgh, Feb. 11. Born in Warren, Pa., he was a resident of Pittsburgh for over 60 years.

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George B. Merrell, 73, founder of the Forest City Steel & Iron Co., Cleveland, at his home in Lakewood, O., Feb. 10. He sold his interest in the company in 1898, and subsequently entered the real estate business.

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John E. Barclay, 54, for the last 38 years associated with the ore shipping department of Pickands, Mather & Co., Cleveland, in that city, Feb. 12. He was first employed in the company by the late Harry Coulby in 1896 as an office boy.

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R. J. Fullbright, 57, for ten years master mechanic for the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., and later for eight years service engineer for the McWane Cast Iron Pipe Co., Birmingham, Feb. 13, following long illness.

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Claude R. Shaffer, 58, until last August president of the John Lees Co., metal stamping manufacturer, Indianapolis, at his home there recently. He joined the company in 1917 and ultimately became vice president and then president, retiring last summer.

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Frank F. Bentley, 66, prominent in industrial and banking circles of the Mahoning valley, at his home in Niles, O., Feb. 11. With his brother, Anson G. Bentley, he organized the Ohio Galvanizing & Mfg. Co. of Niles, and was president until his retirement several years ago.

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Erwin Foerster, 83, vice president of the Frankfurth Hardware Co., Milwaukee, in that city, Feb. 11. Formerly associated with the hardware company of Honore, Palmer & Lockwood, Chicago, he is believed to have been the oldest man in point of years and length of service in the hardware trade in the Middle West.

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Charles R. Flint, 84, whose part in the organization of American corporations earned him the title "father of trusts," in Washington, Feb. 12. Active in shipping business and South American trade, he also was instrumental in formation of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

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Nevin McConnell, 75, who retired in 1919 as general manager of the Forged Steel Wheel Co., Butler, Pa., in that city, Feb. 12. Born in Ireland and for some time active in the steel industry of Scotland, he came to the United States in 1886, being first employed by the Carnegie Steel Co. at Pittsburgh.

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Edwin P. Brown, 65, chairman of the board of the United Shoe Machinery Corp., Boston, in Palm Beach, Fla., Feb. 8. From 1893 to 1899 he was western sales agent for the Colorado Fuel & Iron Co. at El Paso, Tex. Starting with the shoe machinery company in 1900, he rose to the presidency in 1917, continuing in this office until 1927 when he resigned.

Will Talk on Chemistry

February meeting and dinner of the Pittsburgh Foundrymen's association to be held at Ft. Pitt hotel, Feb. 19, will feature an address on "The Chemistry of Cast Iron" by Prof. Robert B. Leighou, department of the chemistry of materials, Carnegie Institute of Technology, Pittsburgh.

Industrial Men in the Day's News

Franklin R. Hoadley, President, Gray Iron Founders' Society

Graduate of Yale, he has since spent his entire business time with one industrial connection.

Serving in the ordnance department during the war, he is now a major in the ordnance reserve.

He has worked his way from foundry apprentice to vice president in his company in a period of 20 years.

FRANKLIN R. HOADLEY, newly-elected president of the Gray Iron Founders' society, has been identified with the Farrel-Birmingham Mfg. Co. Inc., Ansonia, Conn., and with its predecessor since his graduation from Yale university in 1914.

Born in Ansonia in 1890, he received his elementary education at Hill school, Pottstown, Pa., and became connected with the Farrel Foundry & Machine Co., Ansonia, as foundry apprentice in 1914.

During the war he was in the service as lieutenant in the ordnance department, stationed in Buffalo and later overseas. On his return and discharge from the army, he was re-employed by the Farrel company as foundry manager in 1919.

He was elected a director in 1923 and following merger with the Birmingham Iron Foundry Co., Derby, Conn., in 1927, became a director of the newly formed Farrel-Birmingham Co. Inc., manufacturer of rolls and heavy machinery, operating plants in Ansonia, Derby and Buffalo. He was made vice president in 1930, a position which he still occupies. His residence is in New Haven, Conn.

Mr. Hoadley has been active in civic affairs, is a director of the Birmingham National bank, Derby, served as an alderman in Ansonia for two years, is chairman of the national re-employment office for a number of towns in Connecticut and is a member of the CWA district committee.

He is a member of the American Foundrymen's association, a major in the ordnance reserve, a member of the Army Ordnance association and serves on the administrative council of the National Founders' association.

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Alexander E. Walker, since 1930 assistant vice president in charge of sales, Republic Steel Corp., Youngstown, O., has been named general manager of sales. Graduate of the University of Michigan in 1910, he joined the Riter-Conley Co. following his college career, and in 1911 became associated with the LaBelle Iron Works, Steubenville, O., in the general sales department, later being transferred to the Chicago office. He joined the Republic company in 1916 as assistant manager of pipe sales and in 1919 was made assistant general manager of sales in charge of pipe and sheets. Following a sales department reorganization in 1928 he was made assistant general manager of sales with supervision over all products of the company. In October, 1928, he was appointed general manager of sales of the Republic Iron & Steel Co. and in 1930 assistant vice president in charge of sales of the Republic Steel Corp.

Norman W. Foy, Chicago district sales manager since July, 1932, has been chosen assistant general manager of sales with headquarters in Youngstown. He became associated with the old Republic Iron & Steel Co. as a salesman in 1919 and was subsequently manager of the company's Buffalo, Boston and Birmingham, Ala., offices. Shortly after formation of the Republic Steel Corp., he was made assistant western manager of sales.

W. J. Hanna, who has been in the Detroit office of Republic, succeeds Mr. Foy at Chicago as district sales manager.

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David G. Gann and Earl Kribben have been elected directors of A. M. Castle & Co., Chicago, to succeed George Boyce and F. C. Flosi, resigned.

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C. I. Collins has been appointed superintendent of the Cuyahoga works of the American Steel & Wire Co., Cleveland, succeeding J. T. Leatch who has been transferred to other duties. Mr. Collins formerly was general manager of the Morris & Bailey division at Pittsburgh where he functioned in both the production and sales departments. Since this division was absorbed by the American Steel & Wire Co., he has been devoting his time to special work at Cleveland.

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R. G. Russell has been elected vice president and general manager of the Cyclone Fence Co., Waukegan, Ill., subsidiary of the United States Steel Corp., succeeding the late Harry G. Chapman. Entering employ of the Steel corporation in 1909 as a clerk at the Waukegan works of the American Steel & Wire Co., Mr. Russell two years later became associated with the Cyclone company and has held successively positions of salesman, branch manager at Fort Worth, Tex., and vice president and general manager of the Standard Fence Co.,

(*Please turn to Page* 56)

R. G. Russell

EDITORIAL

Let's Try NRA Codes Fairly Before Further Experiments

TO DATE about 280 codes of fair competition under NRA have been approved. Many of the important divisions of the iron, steel and metalworking industries now are codified. Their experience in working under code provisions ranges from a week or two, in the case of foundry equipment, foundry supply, gray iron foundry, chain manufacturing, electrical truck and other industries whose codes have gone through the mill since Feb. 1, to a full half-year in the case of the steel producing industry. (Its code became effective just six months ago today, Aug. 19.)

It is difficult to generalize from the varying experiences of these groups. However, it is safe to say that the majority of industrial executives are more favorable to operating under NRA codes than was believed possible when NIRA was enacted. Probably no individual in the country is entirely satisfied with any code, yet the majority believes that the advantages of codes outweigh the disadvantages.

This favorable opinion — although rather definitely established in many branches of the iron, steel and metalworking industries—is not too firmly entrenched. In fact, it rests more upon the hope that the codes will work out advantageously in the future than upon the actual results obtained thus far. In spite of the flattering approval of codes expressed by steel producers, automobile manufacturers and others when the terms of their codes were extended. the plain truth is that the majority of pacts under NRA still are under trial. Their ultimate, net worth still remains to be actually demonstrated.

Radical Changes in Codes not Timely Until Present Conditions Can Be Met

It is to be hoped that this fact is fully recognized by the administration and by congress, labor, consumers and other factions interested in the success of NRA. There are signs that certain forces in these groups are anxious to change existing codes radically. They seem to be on the point of asking industry to undertake new burdens before it has had time to adjust itself to the original requirements of NRA as now being administered.

For instance, pressure is strong in Washington for a reduction in hours from 40 per week, provided in many codes, to 32 or even 30. The advocates of the shorter week do not seem to realize that industry has not yet digested the 40-hour week. Very few companies have been fortunate enough to have increased their income sufficiently to cover the expanded payroll incurred under NRA. In many cases, this condition has plunged companies deeper in red.

Nevertheless, management has submitted to this additional drain on its resources with patience, largely because it values the freedom from ruthless price competition which NRA codes afford. The majority of industrial concerns have been willing to pay a big price for the opportunity to sell above cost. Moreover, with a few exceptions, industries in the iron, steel and metalworking classification have been extremely modest in pushing up prices. They have refrained from advancing prices far enough to cover their increased costs. Many are gambling upon future volume to equalize the burden and only time will tell whether the extra margin of cost can be covered.

Impossible Condition Threatens Unless Industry's Position Is Consolidated

But now Washington apparently wants to restore the full effect of the anti-trust laws and to throw open-price provisions out of the codes. To do so would change the conditions of operating under NRA so drastically that no ordinary company could survive unless it could be kept alive by federal funds. This would be disastrous in the extreme and in time would probably result in complete socialization of industry with consequent destruction of private initiative and enterprise.

It is high time that the tinkerers with the NRA machinery realize that the nation must be given a little time to consolidate its position. The public, labor and industry cannot make progress under a system in which the rules are changed so frequently that no one can learn to operate under them. Already, industry has made good progress in adapting itself to requirements of NRA, but much remains to be accomplished.

NRA codes are serving several useful functions. Gradual modification and refinement are necessary and desirable, but the country is not yet ready for such drastic changes as shortening of the week to 30 hours or abandoning open prices.

We hope that moderation rather than experiment or radical change will mark the March 5 meeting of code authorities. Let us not bite off more than we can chew at one time.

THE BUSINESS TREND

Anniversary of Bank Holiday Finds Business Gaining

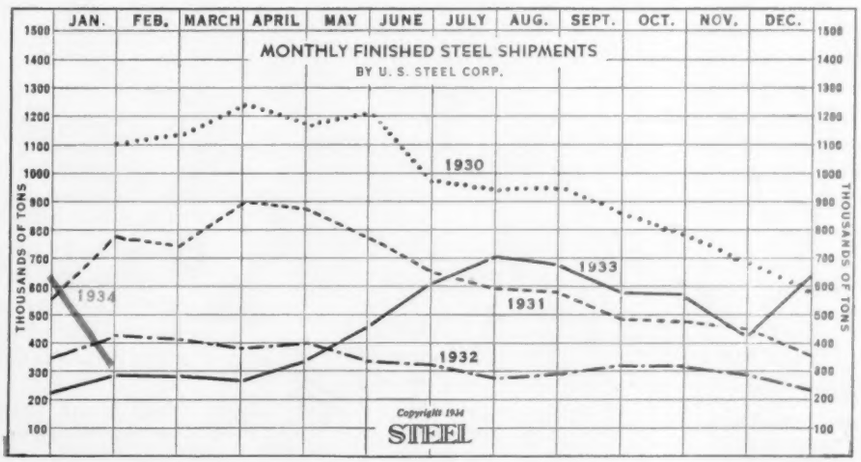
TWELVE months ago Governor Comstock's bank holiday in Michigan was in effect. Throughout the nation financial and business men were anxiously awaiting developments, hoping that the strenuous effort of the government to confine the trouble within the local area would succeed. It failed, and most of the political, economic, social and financial events of the past year have been influenced by that failure.

Had it been possible to avoid the bank closings, the business history of 1933 probably would have been less hectic than it was. The "new deal" would have been launched with far less enthusiasm. The spurt of April to July last year probably would have been more moderate and the reaction in the fall would have been milder. Perhaps the curve of industrial production in the United States would have corresponded more closely with that of Canada. In the dominion, the spring and summer improvement carried into September and October, whereas in the United States the reaction set in in August. The decline in Canada was shortlifed, gains having been resumed in December.

Today the United States again is in another cycle of recovery, with all signs pointing to marked improvement in the next few months. With the lesson of last year's too-rapid climb before it, the business world and the government is giving more attention to control of the forces which contribute to a runaway situation. With congress in session, the outward expression of antagonism against "big business," Wall street speculation, excessive profits, etc., is more rampant. The activities of Borah and Nye on Capitol hill and of Roosevelt in the White House not only are putting fear in the hearts of business buccaneers, but also are causing honest business men to wonder whether the innocent bystander is safe. In intent, this wave of housecleaning is wholesome; in practice, it may tend to injustices and to unfortunate restraints.

Improvement Continues, But More Uniform Distribution of Gains Would Help

Industrial activity continues to gain strength steadily. However, improvement still is woefully unbalanced. In fact, at this stage of recovery, a better distribution of business gains probably would be much more beneficial than the existing condition, wherein certain industries are forging ahead while others lag.

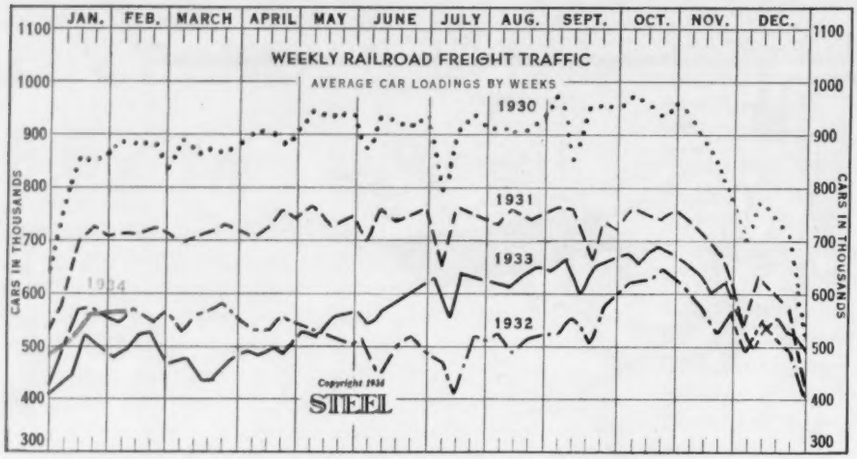


1934 Tons
Jan. 331,777

1933
Dec. 600,639
Nov. 439,358
Oct. 572,897

1933 Tons
Jan. 285,138

1932
Dec. 227,576
Nov. 275,594
Oct. 310,007



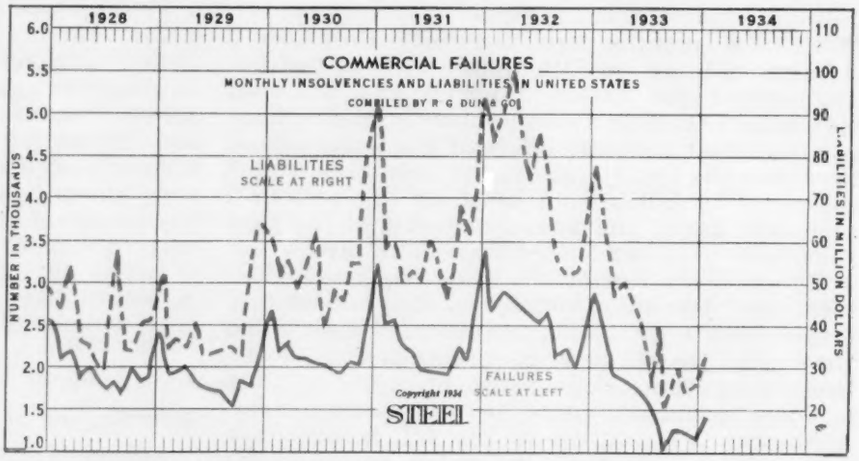
Freight Movement Up Slightly In First Week of February

Loading of revenue freight increased slightly during the week ending Feb. 3, according to the weekly report of the American Railway association. Loadings during the week totaled 564,098 cars. This was an increase of 2532 cars over the movement of the preceding week; and an increase of 78,039 cars over the loadings in the like week of 1933. It was, however, a decrease of 9825 cars, or 1.7 per cent, over the comparable period in 1932.

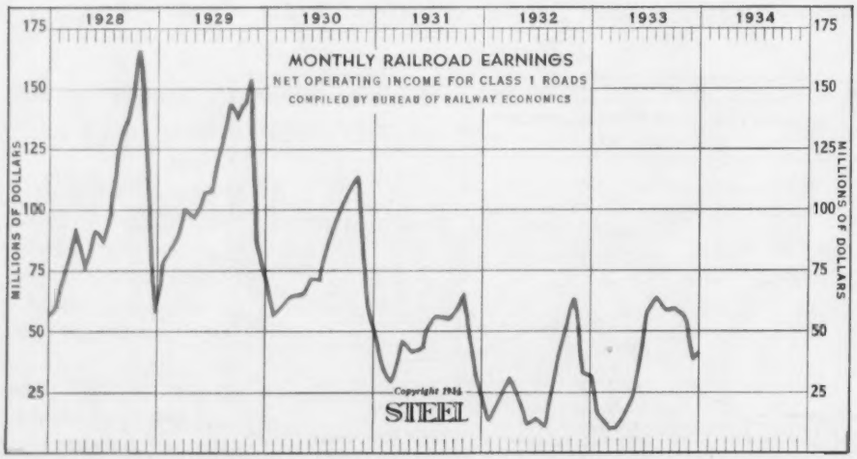
	1934	1933
Feb. 3	564,098	486,059
Jan. 27	561,566	475,292
Jan. 20	560,430	499,554

Record of Commercial Failures Continue at Low Ebb

Commercial failures, reported by Dun & Bradstreet, Inc.. numbered 1364 in January, 1934, compared with 1132 in December and 2919 in January, 1933. Some large failures during January increased the total of liabilities somewhat, although the amount was very much smaller than for January a number of years past. The aggregate of indebtedness reported for defaults that occurred last month was $32,905,428. This compares with $27,200,432 of liabilities recorded for December last, and $79,100,602 for January, 1933.



	Number	Liabilities
January, 1934	1,364	$32,905,428
December, 1933	1,132	27,200,432
January, 1933	2,919	79,100,602



December, 1933	$37,763,877
November, 1933	37,565,822
December, 1932	32,304,894

Railroads Earn 1.80 Per Cent On Investment in 1933

Class 1 railroads in 1933 had a net railway operating income of $474,369,438 which was a return of 1.80 per cent on their property investment, according to complete reports for the year filed by the carriers with the Bureau of Railway Economics. The net railway income in 1932 was $326,317,936 or 1.24 per cent on investment. During December, 1933, net operating income of class 1 carriers amounted to $37,763,877 which was a return of 2.35 per cent annually on their property investment.

DIEMAKERS: 80 per cent of the cost of a die is labor. Here is a general view of the diemaking department in a modern die casting plant

IMPROVED DIE STEELS KEY TO GREATER ECONOMIES IN DIE CASTING

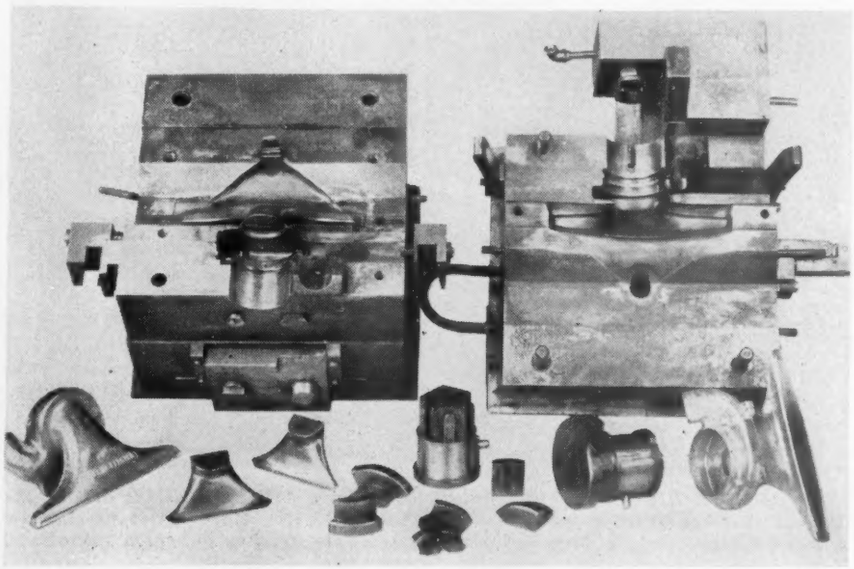
BY A. H. ALLEN
Associate Editor, STEEL

UPON steel rests the major responsibility for greater achievement in the field of die castings, especially aluminum and brass. Steel, in the form of dies, is the heart of the die casting operation, and with thousands of dollars in many instances invested in the machining and heat treatment of dies, service and life are prime factors.

Die casting manufacturers generally are of the opinion that if a die will stand up successfully after 250,000 "shots" the die cost may be written off and a new die justified; but many present dies are a long way from attaining this goal. The Precision Casting Co. Inc., producer of both zinc and aluminum die castings in large quantities, with plants in Syracuse, N. Y., and Cleveland, has perfected its die technique to the point where dies for aluminum castings will satisfy the requirements of a quarter of a million shots, all conditions being favorable.

However, difficulties with die steels to be used for aluminum castings still persist, chiefly because of the higher temperatures involved. It devolves upon steelmakers to develop suitable alloy steels which will not check or crack, thereby resulting in defective surfaces on the casting.

This is not to say that steelmakers have failed to recognize this problem, but merely that there remains work to be done in the further perfection of die steels to resist the constant strains imposed by temperature and pressure effects encountered in the casting of aluminum and other higher melting point nonferrous alloys. Research work recently



COMPLICATED ASSEMBLY: To form the vacuum cleaner suction nozzles shown lower right and lower left, these nine cores must be positioned in the die before every shot

FINISHING DEPARTMENT: Here castings are trimmed, if necessary, ground, drilled and otherwise prepared for shipment

carried out by other interests has attempted to circumvent the die problem by use of a special type of die casting machine, embodying a cold pressure chamber and the use of higher pressures on the metal, ranging from 4000-15,000 pounds per square inch. Under these pressures, such materials as aluminum and brass can be cast at considerably lower temperatures and wear on dies thereby is reduced. A denser, more compact casting also is claimed.

For the production of zinc die castings with the temperature of the molten metal being about 800 degrees Fahr., a low-chrome steel is used with carbon content of approximately 0.40 per cent. The dies are heat treated to a brinell hardness of 380-400, involving heating to 1600-1625 degrees Fahr., quenching and drawing at 1050-1100 degrees.

For dies to be used in production of aluminum castings, where the metal temperature is higher—about 1250 degrees Fahr.—a number of alloy steels have been used with fair results. Typical of these is a cobalt-chrome-tungsten steel, about 0.45 per cent carbon. It is heat treated at 1825-1850 degrees, quenched or allowed to cool in air and drawn at 1100-1150 degrees, to a brinell hardness of 400-425.

Die Surfaces Plated

Interesting experiments have been made in chrome-plating the working surfaces of dies and results have warranted adoption of this practice on certain dies. Thickness of the plating is usually 0.004-0.005 inch. All dies are drilled for circulation of cooling water, in some cases as many as 32 water lines being provided on a single die.

In probably few industries is there such a wide range of products made, both in regard to size and shape, as is found in die castings. An example of this wide diversity is given by listing a few of the many hundred parts produced successfully in die castings: Radiator shells; automobile engine crankcases; automobile hardware; outboard motor parts; carburetors; superchargers; agricultural machinery parts; kitchen equipment such as fruit juicers, egg beaters and the like; plumbing tools; cradle telephone stands; washing machine top frames, agitators and other parts; vacuum cleaner parts; bases for displaying drill sets; thousands of small gears, including even spiral and bevel ring gears and pinions; typewriter frames; pipe fittings; and camera frames.

To this heterogeneous list could be added many others, but a sufficient number is included to convey some idea of the skill and painstaking care which must be used in constructing dies. It has been estimated that 80 per cent of the cost of an average die can be charged to labor.

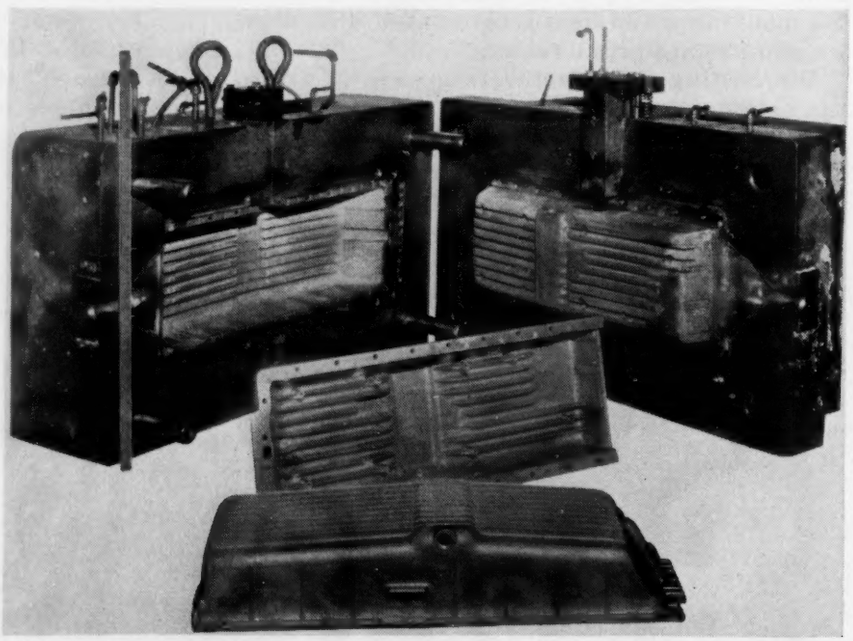
In recent months manufacturers have noted with some alarm the effects of NRA codes upon labor costs. This is particularly true in the die casting field, since diemaking is a highly skilled technique, requiring considerable time. With new restrictions on hours of work under NRA, serious labor problems arise when it is necessary to turn out a complicated die within certain time limits.

The Precision company has pioneered the manufacture of large die castings, typical of which is the automotive engine crankcase shown in an accompanying illustration. This large aluminum casting weighed 16 pounds and was produced in the die shown in the same illustration. The die, weighing 9000 pounds, is said to be one of the largest ever made for die casting purposes. The crankcases were turned out at a rate of 50 per hour, contrasted with a rate of about 400 shots per hour for many smaller castings.

Heat Must Be Maintained

It is essential in producing large castings to maintain heat in the dies so that perfect fluidity of the casting metal is insured. When casting is first started, a number of spare shots are made to bring the die up to heat. These first shots are imperfect and are scrapped. In some dies recourse has been made to the use of imbedded electric heating elements to keep up the temperature.

Difficulties with dies segregate themselves into two general classes. In the first is the washing or wear-



ONE OF THE BIGGEST: Weighing 9000 pounds, this huge die is one of the largest ever constructed for use in die casting. Of the side-gated type, the die was used for casting a 16-pound aluminum crankcase, two of which are shown in the foreground

ing away of the steel in the gate of the die where conditions of highest heat and pressure are encountered. This trouble is more serious in the case of aluminum than in the case of zinc.

The second class of difficulties includes checking or cracking of the die surface, resulting from strains brought about by the counteracting effects of the hot metal on the die surface and the cooling water immediately beneath; in some cases not more than ½-inch of metal separates the cooling duct from the die surface. This tends to set up serious strains in the die steel. These difficulties are minimized by careful attention to heat treatment of dies.

Some die casting manufacturers do not make a practice of heat treating dies for zinc castings, since temperatures involved are lower than with other metals. Others, including the Precision company, heat treat all dies to obtain maximum productivity.

Die casting machines have evolved gradually from the old hand-operated types to the semiautomatic design and the full automatic type of machine. Machines are of two types—center and side gated. In the former, metal is fed through a central hole into the stationary half of the die. In the latter type, the gate is provided at the parting line of the dies on the side most convenient.

When complicated shapes are to be cast, with undercutting, holes, lugs and the like, cores must be pulled and brought back into position before the metal is admitted. In older types of machines, these cores were operated by hand for each cast. Die designers of today have worked out a system of racks and levers by which on some dies these cores are operated automatically, thus speeding up production measurably.

An example of a complicated die assembly is shown in an illustration on page 23 of a vacuum cleaner suction nozzle. This die is of the center gate type and has nine cores which must be placed in position before the casting is shot. The castings were made at a rate of 30 per hour.

Steel Paving Is Tried in Germany

A SECTION of a street in Dusseldorf, Germany, recently was paved with steel, according to reports emanating from that country. Some of the features of this type of construction were described in the *Excavating Engineer* for January.

The steel grates or plates have a length of about 19½ feet, a width of 3¼ feet, and weigh 397 pounds each. They are shop fabricated and delivered ready made, thus facilitating laying. The foundation upon which the sections are laid is composed of basalt gravel. The units are anchored solidly and fastened together either with bolts or by welding, and the depressions and grooves are filled with macadamized tar to a depth which insures a level surface. The macadamized tar is reinforced with steel strips.

400 *SHOTS AN HOUR: This rate is attained on some castings produced in modern casting machines, a few of which are shown in this illustration*

Grates Welded to Base

Individual sections consist of zigzag shaped, high-edged, steel grate-rods running crosswise to the road and resting on a longitudinal wide base to which they are welded or bolted. The gravel filling needs no retainer, as its purpose seems to be merely to fill the spaces in the grates and prevent the accumulation of dirt and water.

From observations made thus far, rubber tires do not suck out the filling, but after a time the ribs of the plates protrude slightly to form the contact surface. The surface thus obtained is slightly corrugated and this in combination with the zigzag formed rods provides good traction.

Among advantages claimed for the steel pavement are durability, rapid construction and brief interruptions of traffic. According to Prof. Grunner of Graz, 3¼ feet of road, 19½ feet wide, can be paved with steel grates in 5 minutes. It is estimated that a highway of a width of 59 feet would require about 800 gross tons of steel per mile.

Cost as estimated by the Studiengeselschaft, under whose auspices the steel paving in Dusseldorf was carried out, is from 8 to 9 marks per square meter. Use of such paving on connecting streets and between great traffic centers may be considered, also in such regions as northern and eastern Germany where paving stones are not available. Transportation costs of steel grates, in comparison with stone, are relatively small.

Steel grate paving is not entirely new, for many previous attempts have been made in other countries. In Austria a stretch of steel road is said to have been in use for a long time and is well preserved. The subject has come to the fore at the present on account of the serious unemployment situation and because of the many idle steel mills.

The writer of this report in the *Excavating Engineer* recalls that a steel company in Sault Sainte Marie, Ontario, Canada, some ten years ago laid a stretch of steel paving extending for a distance of about 200 yards, leading from its plant. When last seen in 1931, the steel plates appeared to be in good state of preservation. Although the plates were similar in size to the German steel grates, they were of an entirely different construction, being made of solid steel plates, about ⅛ inch in thickness. They were laid in two strips covering the wheel tracks.

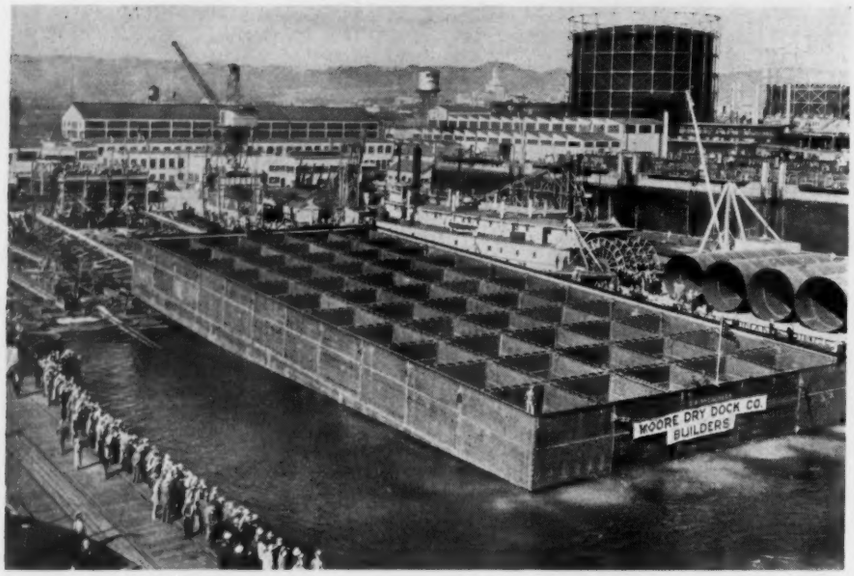


Photo by Gabriel Moulin, San Francisco

FIG. 1: Launching the lower section or cutting edge for pier 4 of the San Francisco-Oakland bridge. The caisson is built up to a height of 77½ feet in drydock, later to 192 feet in position. Note adaptor sections and vertical pipe units alongside

Steel Fitted to New Method Of Caisson Construction

BY B. J. OSBORNE, Construction Manager
Moore Drydock Co., Oakland, Calif.

REPUTED to be the largest caisson ever constructed, and launched recently at the yards of the Moore Drydock Co., Oakland, Calif., the steel structure shown in Fig. 1 is for pier No. 4, main anchorage for the west bay superstructure of the San Francisco-Oakland bridge. It is 92 feet wide by 197 feet long and 17 feet 6 inches high. When completed and turned over to the general contractors the height will be 77 feet 6 inches. Later, as the caisson is sunk into place in the bay, additions will bring the total height to 192 feet. A number of these caissons are required for the east bay and west bay bridge anchorages.

Comprises Watertight Cells

The launched section comprises only the lower part or cutting edge of the caisson, made up of watertight segments approximately 17 feet 6 inches in height and length and 3 feet 6 inches in width. Construction required 700 tons of plates and 200 tons of structural shapes. It was necessary because of the deep flotation draft to extend the launching ways in order to gain the proper depth of water and to insure the caisson itself against excessive internal stress.

The caisson superstructure embodies a welded steel frame comprising steel columns, beams and cylinder plate work. Side walls are formed of horizontal 21-inch I-beams, to which are bolted vertical 10 x 12-inch timbers, the latter covered with diagonal, creosoted 4 x 12-inch sheathing. The timbers will be calked in ship plank manner with oakum and cement used to make them watertight.

Interior of the caisson is of cellular construction. The cells, or dredging wells, of which there will be 55, are formed on the bottom cutting edge by 15-foot square openings. To these openings are attached adaptor sections, 6 feet 6 inches high, 15 feet square on the bottom and formed to a 15-foot circle at the top. Secured to the tops of the adaptor sections and extending upward, as the height of the caisson increases, will be erected 15-foot diameter welded steel plate cylinders or pipes. The interior will be strengthened further by the addition of steel wale beams along the sides and by steel cross struts on the ends. Fig. 2 shows one of the caissons in process of being built up to shop height in drydock.

New System for Sinking

After the caisson has been built up to shop height and towed in position, steel domes are welded over the dredging wells to maintain alignment of the structure. The domes are provided with pipe outlets leading to air compressors. Thus, in the construction work, air pressure can be admitted to any of the cells if it is necessary to insure stability.

To start sinking of the caisson, concrete and reinforcing bars are placed around the outer walls of the cells, the added weight depressing the entire structure. When the top of the caisson has moved down a certain distance, pouring stops. One

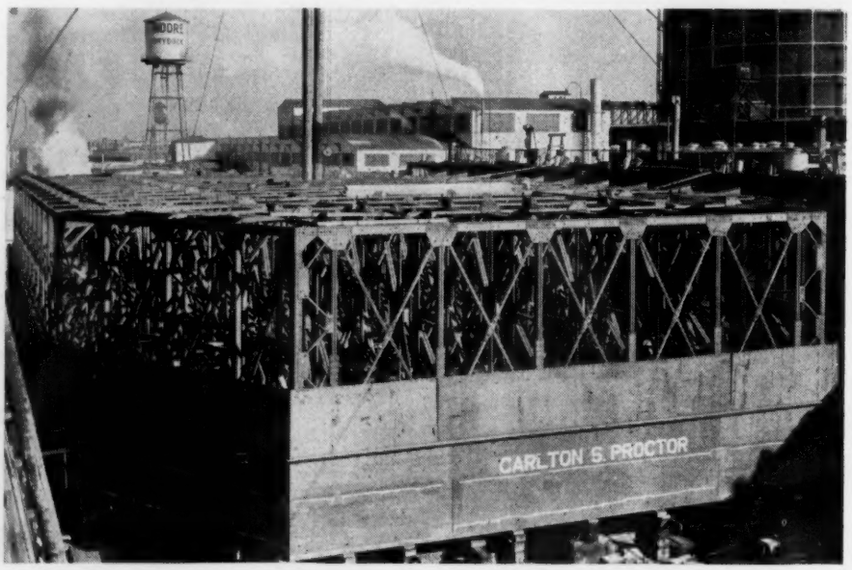


Photo by Gabriel Moulin, San Francisco

FIG. 2: Another caisson in drydock, partially built up to shop height. The maze of structural steel work required in one of these units is apparent

Structural Steel Tonnage in Bridge Caissons

Pier No.	Size, feet	Shop height, feet	Total height, feet	—Plates, tons— Shop height	Total height	—Shapes, tons— Shop height	Total height
			West Bay Caissons				
3	74½ x 127	73½	228	711	2365	452	750
4	92 x 197	77½	192	1495	3537	860	1452
5	57 x 127	73½	115	512	905	448	508
6	74½ x 127	73½	180	711	1743	410	876
			East Bay Caissons				
E3	80 x 134½	13½	13½	250	250	84	84
E4	60 x 90	11	11	123	123	42	42
E5	60 x 90	11	11	123	123	42	42

by one, the cells are relieved of air pressure, the domes cut off by torch, a 20-foot length of pipe set up and welded, the dome rewelded to the top of this new section and the air pressure again applied.

Each of the 55 cells receives an additional length of pipe in the same manner and at the same time the additional cross bracing in the interior and sides is added and the pouring of concrete resumed. This process of building up cells and filling in around them continues until the caisson is sunk to the mud floor of the bay. Whereupon some of the domes are cut off the tops of the dredging wells and clamshell buckets lowered to remove sand and mud. This process continues and other domes are removed to permit excavating.

Eventually the caisson will rest on the rock floor. Naturally this rock floor is not level and consequently will be built up level by excavating through certain cells and pouring concrete under pressure until it rises in the cell about 30 feet. This likewise is done in other cells until finally a solid mass of concrete is built up under the caisson and it rests level. The next step is to fill the cells with concrete to the top, and the foundation then will be ready for the steelwork of the bridge tower.

The Moore Drydock Co. was awarded the subcontract for caissons for piers No. 3, 4, 5 and 6 for the west bay substructures from the Transbay Construction Co., and also the caissons for piers No. E3, E4 and E5 for the east bay substructures from the Bridge Builders Inc. All caissons are symmetrical in design but of different sizes. Dimensions and tonnages of plates and shapes involved in each are shown in the accompanying table.

Total tonnage of plates and shapes involved in these seven caissons is 9046 tons and 3754 tons, respectively. Electric arc welding will be used in the major portion of the caisson structural work, over 60 miles of welding being required.

Traces of Hydrogen Sulphide in Gas Cause Heavy Pipeline Corrosion

A NEWLY recognized type of corrosion in natural-gas transmission lines where only traces of hydrogen sulphide are present (12 grains or less per hundred cubic feet) has been studied and reported upon by the bureau of mines.

As a part of this work, bureau engineers have had under observation a transmission line operating at an average pressure of 300 pounds per square inch, transporting gas that contained 2 grains or less of hydrogen sulphide per thousand cubic feet. Within the last few years several failures have occurred in this line; brought about by the gradual thinning of the walls of the pipe to the point of failure. Reductions of wall thickness, if permitted to continue unobserved with no corrective measures taken before the strength of the metal is reduced below the point of rupture, are likely to be both costly and hazardous, as failure may occur without warning and with explosive violence.

Replacement Costs High

The corrosive effect of hydrogen sulphide on steel and other materials used in the manufacture of oil-industry equipment is evident from the annual replacement costs caused by this gas. Heretofore, corrosion by gases containing traces of hydrogen sulphide has been regarded as a particular type of ordinary gaseous corrosion where the subject metal is in an essentially dry condition and the three important factors considered were per cent of hydrogen sulphide in the gas; per cent of oxygen in the gas, and per cent of water vapor in the gas.

After a number of practical field inspections made where internal corrosion of transmission lines carrying gases containing only traces of hydrogen sulphide was evident, the data indicated that no serious corrosion could be attributed to the ordinary type of gaseous corrosion. Instead, at seriously corroded areas a perceptible and even considerable quantity of water existed upon the metallic surface during corrosion. The bureau has designated corrosion in which the subject surface is covered with a sensible film of water by the term "modified gaseous corrosion."

The work of the bureau of mines on modified gaseous corrosion has been reported in technical paper 560, entitled "Corrosion of Steel by Gases Containing Traces of Hydrogen Sulphide; Effect of Pressure and Moisture Conditions." The authors are John M. Devine, C. J. Wilhelm and Ludwig Schmidt.

Summation of Conclusions

General results of the study of modified gaseous corrosion can be summarized as follows:

Traces of hydrogen sulphide in a gas may cause severe corrosion if oxygen and water are present. Modified gaseous corrosion in which precipitated water is present on the surface of the metal is much more severe than ordinary gaseous corrosion in which no precipitated water is present on the surface of the metal although the gas may be saturated with water vapor. Pressure accelerates the action in both forms of corrosion, but this effect is particularly noticeable in modified gaseous corrosion.

Application of pressure to a gas also may increase the corrosion rate by causing precipitation of moisture on the surface of the metal, thus transforming ordinary gaseous corrosion to modified gaseous corrosion. The corrosion - threshold concentration of hydrogen sulphide, or the amount necessary for producing severe corrosion, is lower for modified gaseous corrosion than for ordinary gaseous corrosion. Modified gaseous corrosion appears to be the result of an electrochemical reaction, while ordinary gaseous corrosion has the characteristics of a chemical attack.

The corrosion rate with modified gaseous corrosion increases with a decrease in the thickness of the moisture film on the surface of the metal, but with continued reduction the reaction finally loses its electrochemical character and becomes ordinary gaseous corrosion. Modified gaseous corrosion can occur in the absence of hydrogen sulphide if oxygen is pres-

ent; such corrosion, also, is accelerated by pressure.

In natural-gas pipeline systems, modified gaseous corrosion is the chief consideration in combating corrosion caused by gas containing traces of hydrogen sulphide. Steps that may be taken to reduce corrosion losses in pipeline systems include: (1) Removal of hydrogen sulphide from the gas; (2) reduction of oxygen content of the gas; and (3) control of humidity condition.

Copies of technical paper 560 are to be obtained from the superintendent of documents, government printing office, Washington, at 5 cents each.

Stainless Steel—in Dairies And in Modern Buildings

Those desirous of keeping posted on the literature of stainless steels will be interested in publication of two booklets dealing with use of this material in dairy and milk plant equipment, and in architectural applications.

The former is published jointly by the National Tube Co. and the American Sheet & Tin Plate Co., Pittsburgh, and devotes 16 pages to descriptive matter, tables and illustrations pertinent to the use of 18-8 chrome-nickel steels in various branches of the dairy industry. Copies are available upon request.

The second booklet is published by Republic Steel Corp., Youngstown, O., and contains 12 pages of data and illustrations on architectural applications of stainless steel —its fabrication, properties, shapes and finishes available, and a list of distributors who maintain warehouse stocks. The booklet, identified as bulletin 124, may be obtained from the Republic company.

Electrical Engineers Will Hold Spring Meeting

Association of Iron and Steel Electrical Engineers under auspices of the combustion engineering division will hold its spring engineering conference in the Ohio hotel, Youngstown, O., April 12.

Subjects to be discussed will include the pickling of billets, sheets, black plate and strip steel; electro and abrasive cleaning of steels; hot galvanizing of sheets; super-refractories; heat-resisting metals; electrically-heated furnaces for annealing and normalizing; and box annealing furnaces gas fired through heat resistance tubes.

F. E. Leahy, fuel engineer, Youngstown Sheet & Tube Co., Youngstown, is chairman and J. L. Miller, assistant chief engineer, Carnegie Steel Co., Youngstown, is secretary of the division.

Welding in Railroad Repair Jobs Saves Expense

How gas welding is applied to the repair and maintenance of railroad equipment, such as locomotive frames, cylinders, truck bolsters and similar parts was described by John C. Miller, superintendent of shops of the Nickel Plate railroad, Conneaut, O., at a meeting of the Cleveland chapter of the American Welding society, Feb. 14. Acetylene welding has effected notable economies over methods previously used, Mr. Miller pointed out.

About 50 attended the meeting, which was presided over by A. E. Gibson, vice president, Wellman Engineering Co., Cleveland. Discussion was concluded by a demonstration of stress concentration in celluloid models, revealed by polarized light and arranged to be projected on a screen.

Metallic Lead Lubricant Has Varied Applications

A new metallic lead thread lubricant, claimed to be of considerable value in asembling machinery and in repair of equipment which is subjected to heavy duty, high temperatures and general abuse, recently has been placed on the market by Armite Laboratories, 1900 East Sixty-first street, Los Angeles, Calif.

The product is described as being a finely divided metallic lead in paste form. In use, a film of metallic lead is said to be formed between threads to prevent galling and thereby to speed up repair work. The maker claims that stud bolts on heads and exhaust manifolds of engines will not freeze, neither will pipe threads corrode together, regardless of time, since the lead does not oxidize or harden.

It is stated further that this new lubricant facilitates the insertion or removal of liners and flywheels and improves press work.

ADAPTATION OF TRACTOR MOUNTED WELDERS TO RAILROAD WORK: Here is shown a four-man welding crew of the International Railweld Corp. working at the Chicago Great Western railroad bridge over the Fox river, St. Charles, Ill. The two crawler tractors, built by the Cleveland Tractor Co., Cleveland, each carry two 200-ampere welding generators driven by the power pulleys. This is a comparatively recent development. The ease with which these units are moved along as the job progresses, thus eliminating long costly cables, is said to contribute greatly to the successful and economical results obtained

Will Build Record Size Electrical Equipment

For use in connection with electrification of the Pennsylvania railroad between Wilmington, Del., and Washington, the General Electric Co., Schenectady, N. Y., will construct a 35,000-kilovolt-ampere single-phase waterwheel generator, reported to be the largest ever built in this country. It is being supplied to the Safe Harbor Water Power Corp., to be delivered and erected by Nov. 15.

Also for installation at Safe Harbor, the General Electric Co. is building four 20,000-kilovolt-ampere single-phase transformers, said to be among the largest ever built at the Pittsfield, Mass., works of the company. Weighing about 160 tons each, the transformers will step up voltage as generated at 13,000 volts, to 132,000 for transmission to the railroad high-tension lines. Generator and transformers represent an investment of about $750,000.

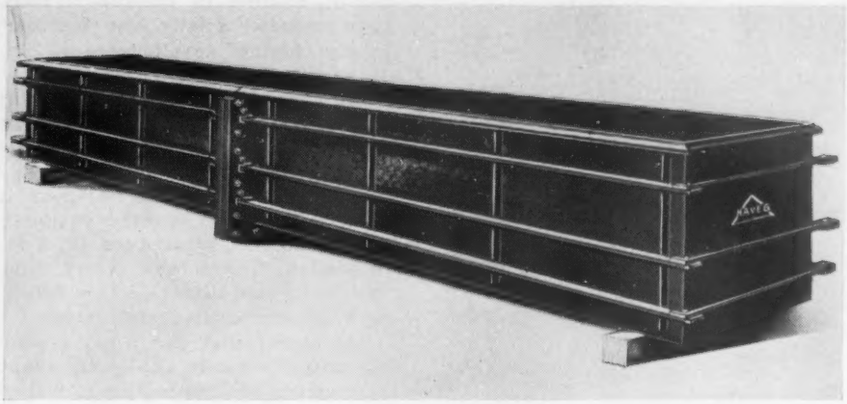


Fig. 1—This comparatively deep tank of acid-resisting, plastic synthetic resin material is made in two sections bolted together. The steel ribs serve as protection against external damage and as reinforcement

Pickling Tanks Molded from Synthetic Resin Material

A SYNTHETIC resin material, a plastic of the phenol-formaldehyde type having unusual acid-resisting properties, recently has been introduced in the United States. Realizing the commercial advantages of a material possessing this characteristic, the Saureschutz Gesellschaft in Germany undertook broad experiments some 15 years ago and the efforts succeeded with the perfection in 1922 of a suitable product. Today, this material, known as Haveg, is being used widely over Continental Europe, the British Isles and in the Scandinavian countries, in steel plants and in chemical and textile industries.

Acid-Handling Equipment

The principal applications of this acid-resisting, plastic synthetic resin in the steel industry are for pickling tanks, and storage tanks for acids. Elsewhere the material is being used in the manufacture of dyestuffs and coal tar products; for tanks, pipe lines and accessories in the handling of acids; for vats and filter presses; for acid absorbtion towers; and for many other types of acid-handling apparatus. In Germany, pickling tanks in more or less continuous use over a period of years still are in operation.

Introducing and manufacturing this new product in America is the Haveg Corp., Newark, Del., a recently organized subsidiary of the Continental-Diamond Fibre Co.

Until development of the German product, it has been regarded as impractical to mold very large pieces of apparatus needed for technical industries because of the tremendous expense of the operations. Moreover, in the past, the most successful types of composition employing phenolic resin used cellulose in some form as a filler, and over a period of time the cellulose was found to deteriorate under acid attack.

To overcome this, the new material uses a special type of acid-resisting synthetic resin which is bonded with acid-washed, long fibered asbestos. The latter material long has been recognized as having definite acid resistance properties. The combination results in a homogeneous mass giving not only a uniform acid resistance throughout, but also applying strength and rigidity plus a considerable resistance to shock. Furthermore, the material is not cracked or affected adversely by temperature changes.

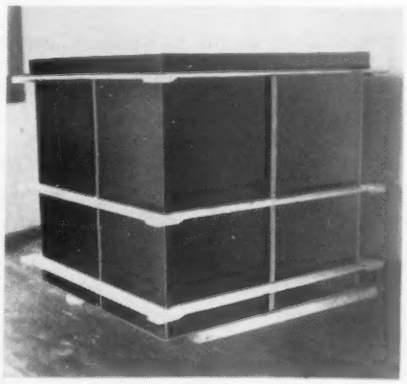


Fig. 2—A 3-foot square acid storage tank of 300 gallons capacity molded from synthetic resin

It is stated that the material is completely resistant to the most commonly employed pickling acids—hydrochloric and sulphuric. This takes into consideration any concentration of hydrochloric and concentrations of sulphuric up to 50 per cent. Likewise, resistance is offered to phosphoric, acetic, citric, tartaric, oxalic and lactic acids in any concentration, and formic acid up to 40 per cent.

The bases ammonia, sodium carbonate, milk of lime; and solvents carbon tetrachloride, paraffin, formaldehyde, trichlorethylene, ethyl alcohol and petroleum oils have no deleterious effects upon the material. Its resistance also covers chlorine, copper sulphate, calcium hypochlorite, hydrogen sulphide and potassium chromates. The oxidizing acids, such as nitric, hot concentrated sulphuric or higher concentrations of chromic acid, however, do affect the material, but despite this there are several records of successful operations covering low concentrates of these acids.

A special grade of material is supplied to meet the unusual characteristics of hydrofluoric acid, but, it is pointed out, this type also gives the acid-resisting properties required for hydrochloric and sulphuric.

No Seams or Joints

To the present, tanks 9 feet in diameter and 9 feet high have been made in a single piece without seams or joints. A tank of these proportions is shown in Fig. 4. After thorough mixing, the asbestos-resin compound is placed in the proper molds and subjected to heat and pressure to form it into a single solid piece. Where larger installations are required, such as a long pickling tank, one or more sections are joined together, the method of joining depending upon the nature of the installation. Tanks of this type are shown in Figs. 1 and 3. The cement which provides the bonds between the sections provides the same chem-

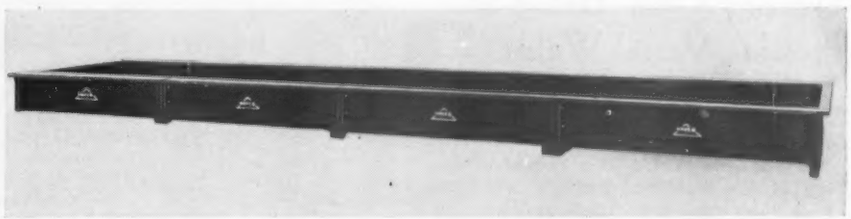


Fig. 3—This shallow pickling tank made of plastic synthetic resin is 26 feet long. It is constructed of four sections bolted together with gaskets between the sections

ical resistance as the material proper.

It was mentioned previously that the material is resistant to shock in marked degree; it withstands blows or shocks exceptionally well and does not chip or fracture easily. However, it might be pointed out further that under conditions of service, such as with pickling tanks, where the equipment might suffer blows and pieces be broken off, the breaks give the same degree of acid resistance as the surfaces of the tank proper, the acid resistance being uniform throughout the material. It is common practice to repair such cracks or breaks on the job if they are not too serious. If the break is of major character, the tank or section can be returned to the factory for repair.

Where high pressures and other severe mechanical stresses are encountered, the asbestos-resin material is reinforced with steel or laminated phenolic sheet material. Thus large rectangular tanks are provided with a skeleton of steel ribs on the outside to prevent bulging, and cylindrical pressure vessels are provided with an external sheet of steel or of laminated phenolic material.

Will Not Contaminate Acid

In addition to pickling tanks, the material has had many other applications in the steel plant. The most common uses have been for storage tanks for pickling acids and for pipe lines for the transmission of acids. An acid storage tank is shown in Fig. 2. These uses and others take into consideration that the material does not contaminate the liquid, neither is it affected by temperature change.

Physically, the material has a compressive strength of about 10,400 pounds per square inch and a bending strength of 5600 pounds per square inch, and a specific gravity of 1.6. It can be used at temperatures up to 265 degrees Fahr. and may be cooled from this temperature to the freezing point without cracking or change, thus being completely unaffected by temperature change, regardless of its rapidity.

The material has a smooth surface which simplifies cleaning and is nonabsorbent. It is easily machined, hence it may be cut, drilled, planed, or otherwise altered to meet changes in setup or operation.

Explains X-Ray Testing of Pressure Vessel Welds

Nondestructive testing of welds in pressure vessels was discussed by Otis R. Carpenter, Babcock & Wilcox Co., New York, at a recent meeting of the National Bureau of Casualty and Surety Underwriters in New York. Although experimental work demonstrated conclusively that it was possible to make welds with

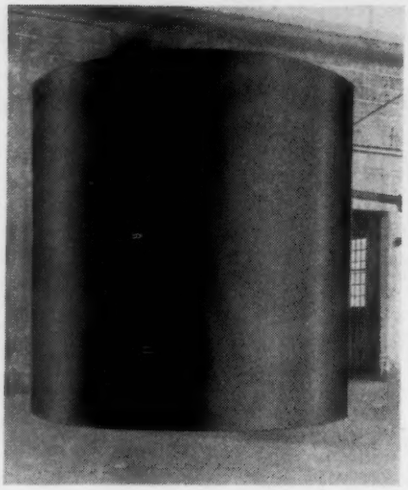


Fig. 4—A 4200-gallon cylindrical tank, 9 feet in diameter and 9 feet high, is molded in one piece without seams. This type of construction eliminates leakage difficulties

physical properties in excess of those of the parent metal, serious objection existed for a long time to use of welding in pressure vessels. This prejudice finally was overcome largely through development of conclusive nondestructive tests.

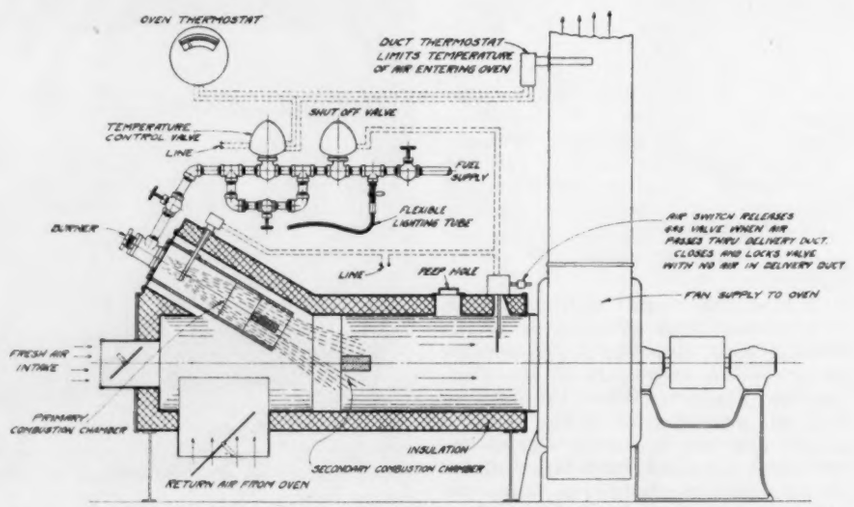
Mr. Carpenter briefly described the Sperry method, the magnetic method and the stethoscopic methods of testing, but it was in connection with the X-ray method that he spoke in detail. His paper covered completely the detailed procedure in X-ray inspection. Numerous X-ray films were shown to illustrate how defects in welds are located and detected.

He stated that the X-ray method constitutes a ready and easily adaptable means of examination of welded vessels, for it shows internal defects as well as those near or at the surface and it furnishes a permanent record of the seam. At present, X-rays are employed for the penetration of plates up to 4½ inches thick. This limitation is due to inability to manufacture a tube which, for production work, will withstand a voltage higher than 300 kilovolts. Mr. Carpenter believes there is little question as to the future ability to penetrate thicker plates.

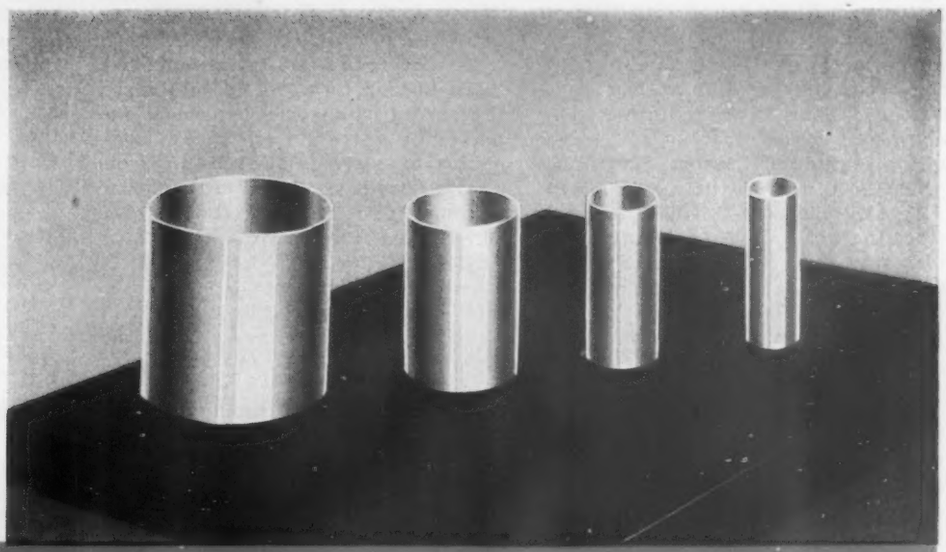
Wire Rod Baker Operates with Controlled Atmosphere

DIRECT firing of baking ovens in rod and wire mills has been made possible by the application of an air heater designed for oil or gas and controlled automatically. The first installation of its kind now is being operated at the plant of the National Screw & Mfg. Co., Cleveland. Based on a run of a few thousand tons, the baking cost averages $0.10 per ton of wire processed through the baking ovens.

The complete installation, designed and made by the Morrison Engineering Co. Inc., Cleveland, and for which patents have been applied, is novel, inasmuch as the percentage of carbon monoxide in the oven atmosphere is kept at a point where the wet lime coating on the work will not have a tendency to combine with it to form synthetic limestone and


OVEN THERMOSTAT
DUCT THERMOSTAT LIMITS TEMPERATURE OF AIR ENTERING OVEN
SHUT OFF VALVE
TEMPERATURE CONTROL VALVE
LINE
FUEL SUPPLY
FLEXIBLE LIGHTING TUBE
BURNER
AIR SWITCH RELEASES GAS VALVE WHEN AIR PASSES THRU DELIVERY DUCT. CLOSES AND LOCKS VALVE WITH NO AIR IN DELIVERY DUCT
PEEP HOLE
FAN SUPPLY TO OVEN
FRESH AIR INTAKE
PRIMARY COMBUSTION CHAMBER
INSULATION
SECONDARY COMBUSTION CHAMBER
RETURN AIR FROM OVEN

Elevation of the automatic burner designed for direct firing baking ovens at rod and wire mills



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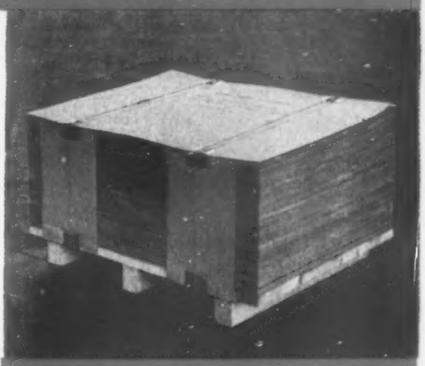
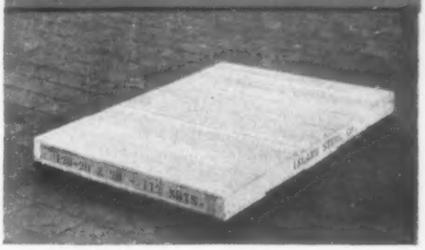
Inland Tin Plate is made in all gages, grades and sizes in both Coke and Charcoal Plate. Secure complete information on Tin Plate made by the most modern methods! INLAND STEEL COMPANY, 38 So. Dearborn St., Chicago, Ill.





Showing two of the Inland methods of packing

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injure the dies in subsequent drawing operations.

The air heater itself, as shown in the accompanying illustration, consists of a burner firing into a primary combustion chamber, and hence into a secondary chamber, where the products of combustion are mixed with fresh air as well as air returned from the bakers. This mixture at a temperature of 450 degrees Fahr. is exhausted by a fan into a duct leading to the baking ovens at the rate of 8000 cubic feet a minute.

Heated Air Is Returned

Air from the bakers is returned through a duct to the heater, entering just below the primary combustion chamber at a temperature of 300 degrees Fahr. Fresh air is supplied to the burner through an intake at the rear, as high as 600 per cent in excess of combustion requirements being used. A slight pressure within the ovens assures a uniform baking temperature throughout.

Two thermostats operate in conjunction with the burner, one for controlling the oven temperature and the other for limiting the temperature of the hot air entering the baker. Once the proper adjustment of the thermostats is made, the baking temperature will be maintained within a tolerance of 5 degrees.

An electric door switch turns down the gas flame to a permanent pilot light as long as the doors of the baking compartment remain open; thermostatic control is restored as soon as the doors are closed. By this arrangement the complete system is independent of operating skill.

A safety gas valve installed in the main burner line greatly minimizes the hazard of an oven explosion. An automatic flame failure switch consisting of a grid glow tube with an alloy electrode immersed in the flame, is connected to the gas valve, so that in case of a failure of the flame from any cause, the safety valve will instantaneously shut off the supply of gas. An air flow switch in the main supply duct also is connected to the safety valve. If the fan should stop, or the flow of air be interrupted for any reason, the gas supply immediately is shut off and the heater cannot be relighted until the fan again is in operation.

Inclusions Serve a Useful Purpose

METALLURGICAL research during the next ten years most likely will include intensive study of the effect of submicroscopic nonmetallic inclusions in steel and development of a means for controlling the quantities. This prediction was made by Robert S. Archer in addressing the Cleveland chapter of the American Society for Metals, Feb. 12, on the subject of "Gases in Steel."

Investigations made during the past decade indicate that large inclusions or segregations, constituting dirty steel, are highly objectionable, but there is a growing conviction that submicroscopic inclusions have a very important and necessary place in the metal. According to Mr. Archer, this conclusion is borne out by the fact that metals lacking these inclusions show poor physical properties and are commercially unserviceable.

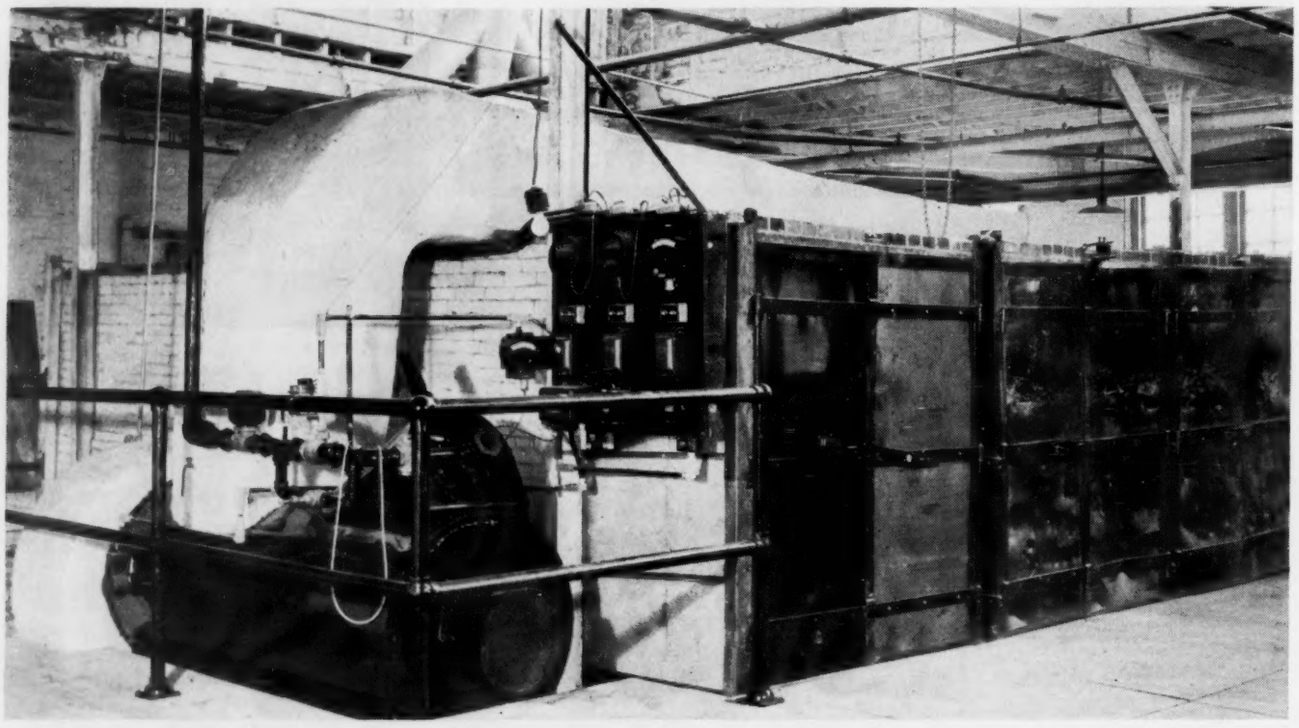
In discussing his subject, the speaker described recent improvements in the vacuum fusion method for determination of gases in metals, pointing out that in his opinion this method would be used more widely and would be an effective tool in revealing the exact influence of the submicroscopic inclusions.

Concur In Opinions

Dr. C. H. Herty Jr., Carnegie Institute of Technology, Pittsburgh, and Dr. Zay Jeffries, consulting engineer, Cleveland, expressed agreement with Mr. Archer's findings as regards inclusions in steel. Dr. Jeffries stated that the proper procedure is to eliminate all inclusions, then by working backward determine what proportion of inclusions is desirable and devise a method by which this quantity can be controlled.

W. H. Phillips, vice president, Molybdenum Corp. of America, Pittsburgh, and national president of the society, and W. H. Eisenman, national secretary, Cleveland, were speakers at the meeting.

The chapter announced an eight-week educational course on "Applied Metallography," to start Feb. 26. It will be conducted by Harry B. Pulsifer, metallurgist, Ferry Cap & Set Screw Co., Cleveland.



This wire baking oven is direct fired by the unit shown at the left. A slight pressure maintained on the interior assures controlled atmosphere reaching every part of the chamber

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STEEL & TUBES — ELECTRIC WELD
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ELECTRUNITE Boiler Tubes last longer because they are more resistant to corrosion. And they resist corrosion for these reasons: the strip steel from which they are made is free from scabs, slivers and rolled-in scale. The surface of the tube is smooth inside and outside. Full-normalizing produces a uniform grain structure, even at the weld. The rolling of the strip gives the tube a dense surface inside and out.

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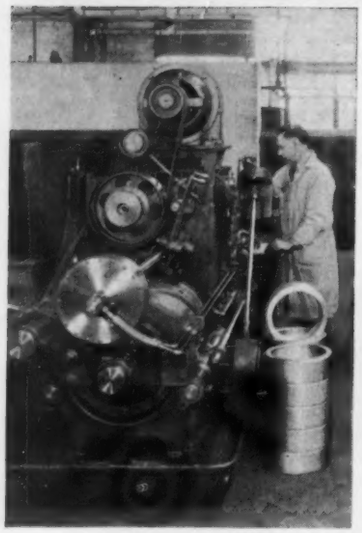


Making the Most *of* METHODS AND MATERIALS

INVESTIGATION has revealed that S. A. E. 3160 steel, as rolled, would be superior to the heat treated carbon steel now in common use for blades such as used on road scraper and maintenance equipment, snow plows, and the like. This nickel-chromium steel has the following approximate composition: Carbon 0.57, manganese 0.78, silicon 0.22, nickel 1.30 and chromium 0.74 per cent. It is somewhat harder and has much higher impact resistance and toughness than the carbon steel. By the use of the nickel-chromium steel in the as-rolled condition, its first cost is as low as that of the heat treated carbon steel, and its economy in the long run should be appreciably greater. Nickel steels as a class, moreover, are resistant to the embrittling effect of exposure to low temperatures; and since scraper blade service often involves use in cold climates, this factor should be considered as another potential advantage in the use of nickel-chromium steel. For most severe conditions, the heat treated S. A. E. 3145 steel is recommended.

$ $ $

It is said that the difference in cost in favor the cast alloy iron crankshaft as compared with the forged steel type is about $1. *This appears to be a small differential, but considering a production of approximately* 2,000,000 *cars, as was the case in* 1933, *it appears to be worthwhile innovation.*

$ $ $

AN ELECTROCLEANER, developed but not yet on the market, is claimed to remove scale, rust, grease and other foreign material from steel in one operation and to leave the surface of the metal as pure and clean as it is possible to obtain. The surface remains rustproof for a considerable length of time. Hardened and tempered spring steel is cleaned effectively by the process, which is simple to set-up and maintain. Grease removed is said to be recoverable.

$ $ $

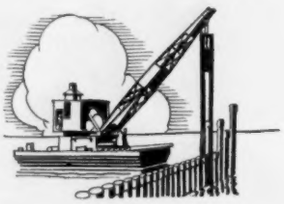
A Pacific Coast steelworks has furnished a number of 2500-pound cast gears for sugar mill machinery in Hawaii. The composition used is a nickel-chromium steel approximating S. A. E. 3240.

$ $ $

Five gasoline stations, featuring welded steel frames and porcelain enamel steel exteriors recently were erected in an eastern city.

$ $ $

A pile driver cylinder weighing 1725 pounds broke and to replace it with a new one would require an ex-



penditure of $385. Because of the tremendous stresses which the cylinder must withstand, repair did not appear practical; however, expert advice from an oxyacetylene service operator was to the effect the job could be done by bronze welding. The casting was repaired by this method and at a cost of only $31. Severe tests afforded convincing proof that the repaired cylinder was capable of withstanding operating stresses.

$ $ $

Use of 18-8 chrome-nickel corrosion-resisting steel as a light-weight structural material is a recent development. This alloy, being austenitic, may be hardened materially by cold working and this property, which usually has been regarded as detrimental, has been used advantageously for the production of cold-rolled light-gage strip with tensile strength of 150,000 to 180,000 pounds per square inch. By suitable fabrication methods, this has been formed into structural members of great strength and rigidity, the non-corrosive properties of the metal making them permanent. Such material has been employed in the construction of airplanes, railcars and motor buses. Its use results in a saving of weight in railway passenger coaches of 75 per cent or more, which provides considerable economy in operating charges.

$ $ $

CAREFUL investigations have shown that considerable variation can exist between the indicated temperatures of pyrometers in furnaces for burning enamel on cast iron and the true temperature of the ware. This is due to the location of the furnace pyrometers in relation to the position of the ware. A large variation in the temperature of the ware produces only a slight variation in the furnace pyrometer.

$ $ $

Engineers look forward to the time when 15 *minutes will be considered reasonably rapid in determining the creep rate of metal. Steel which will creep* 0.001 *inch in* 10 *years will creep approximately* 0.0001 *inch in* 1 *year,* 0.00001 *inch in* 1 *month* 0.0000003 *inch in* 1 *day,* 0.00000001 *inch in* 1 ***hour,*** *and* 0.000000003 *inch in* 15 *minutes. This means that to predict this creep by a* 15*-minute test it is necessary for the physicist to develop apparatus which can distinguish a stretch of* 3 ***billionths of an inch in a*** 1*-inch sample of steel. Engineers of a large electrical manufacturer have developed analytical methods and apparatus which reduce the duration of creep tests from* 3 *months to* 1 *month. New methods and apparatus now being developed may reduce the time of tests to only* 1 *hour.*

$ $ $

Shovels made from monel metal are used by a large mining company in Chile to handle tamping for blast holes. Unlike steel shovels, they will not spark and set off the explosive prematurely. Furthermore, they resist the corrosive action of the tailing or residue from the leaching plant used as tamping material.

The Plastic Forming Of Metals

By PROFESSOR DR.-ING ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part II—Forces and Flow of Material in Technical Forming Processes

7. Force Requirement for Piercing*

IN THE piercing process, the deformations in the longitudinal direction are practically equal for all particles of the body. In contrast to extrusion, the deformations in radial and tangential directions have opposite signs, and are of different magnitudes in the individual zones of the body. The total work of deformation in this case therefore can be determined only as the sum of the work of deformation in all the individual elements of volume.

Values Are Computed

If a billet of circular cross section, having an area F_o, is pierced with a mandrel of area f, as shown in Fig. 96, and converted into a ring-shaped hollow body of area F_1-f; the deformations of the ring-shaped elements of volume in the longitudinal direction (ϕ_l), tangential direction (ϕ_t), and radial direction (ϕ_r), at distances x_o and x_1 from the axis of the body, are given as follows:

*Developed according to E. Siebel and E. Fangmeier[16].

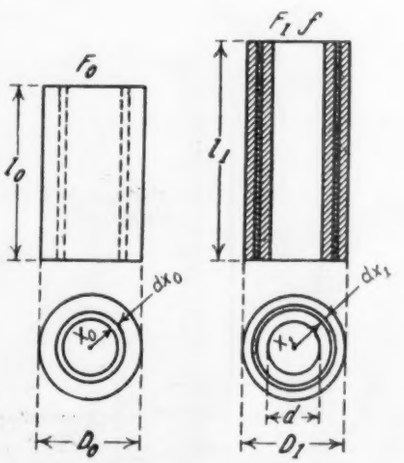


Fig. 96—Deformation relations in piercing

$$\phi_l = \log_e \frac{l_1}{l_o} = \log_e \frac{F_o}{F_1 - F}$$

$$\phi_t = \log_e \frac{2\pi x_1}{2\pi x_o} = \log_e \frac{x_1}{x_o}$$

$$\phi_r = -(\phi_l + \phi_t) = \log_e \frac{F_1 - f}{F_o} + \log_e \frac{x_o}{x_1}$$

The last of the three equations arises from the condition of constant volume of the elements of volume before and after the deformation. The condition of constant volume, however, must also exist for the core of the body up to the distances x_o and x_1. By this means, the relations are obtained:

$$-x_o^2 \times l_o = \pi x_1^2 \times l_1 - f \times l_1$$

$$x_o = \sqrt{\frac{\pi x_1^2 \times l_1 - f \times l_1}{\pi \times l_o}}$$

With this value for x_o, and with $\pi \times x_1^2 = F$, the foregoing equations assume the form:

$$\phi_l = \log_e \frac{F_o}{F_1 - f} \quad \text{.....(48a)}$$

$$\phi_t = \frac{1}{2} \log_e \frac{F}{F - f} - \frac{1}{2} \log_e \frac{F_o}{F_1 - f} \quad \text{.....(48b)}$$

$$\phi_r = -\frac{1}{2} \log_e \frac{F}{F - f} - \frac{1}{2} \log_e \frac{F_o}{F_1 - f} \quad \text{.....(48c).}$$

Because the deformation in the radial direction during piercing has the absolute maximum value, as long as no reduction in length occurs, it is decisive for the energy consumed during deformation. The work of deformation in each circular element of volume, according to equation (24), therefore is given by the relation:

$$dA = 2\pi \times x_1 \times dx_1 \times l_1 \times K_f(\phi_r)$$

$$= dF \times l_1 \times K_f(\phi_r),$$

and for the total work, the integral is obtained:

$$A = \int_f^{F_1} dF \times l_1 \times K_f \times \phi_r =$$

$$(F_1 - f) \times l_1 \times K_f(\phi_{r_m})$$

$$= F_o \times l_o \times K_f(\phi_{r_m}) \quad \text{.....(49).}$$

The average deformation of the hollow body in the radial direction then is given as:

$$\phi_{r_m} = \frac{1}{F_1 - f} \int_f^{F_1} \phi_r \times dF.$$

If the integration is carried out, the result is:

$$\phi_{r_m} = \frac{1}{2}\left[\log_e \frac{F_o}{F_1 - f} + \frac{F_1}{F_1 - f} \log_e \frac{F_1}{f} + \log_e \frac{f}{F_1 - f}\right] \quad \text{.....(50).}$$

The force on the mandrel now can be determined without difficulty, according to equation (26), as:

$$P = F_o \times K_f \times \phi_{r_m} \quad \text{.....(51).}$$

In practice, two piercing processes*, which are represented in Fig. 97, are especially interesting; namely, piercing with axial displacement of material, and piercing with lateral displacement of material. In piercing with axial displacement, the die is filled completely by the cross section of the billet. The displaced material therefore is forced to escape in the direction opposite to that of the advancing mandrel, and the finished hollow body has a correspondingly longer length than the original billet. In the second case, the die permits lateral yielding of the displaced material. The hollow body therefore has approximately the same length as the original billet. This method of working is used in the free piercing of shorter bodies.

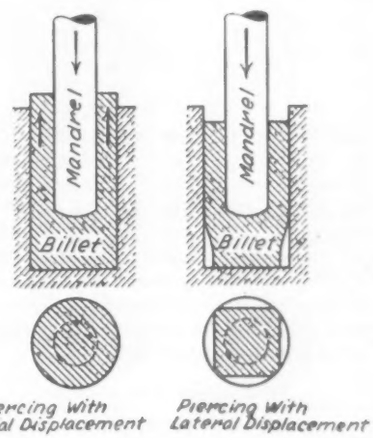


Fig. 97—Diagrammatic representation of piercing processes

*The tube rolling process, which operates on a different principle, is treated in detail in Part III, Section 4.

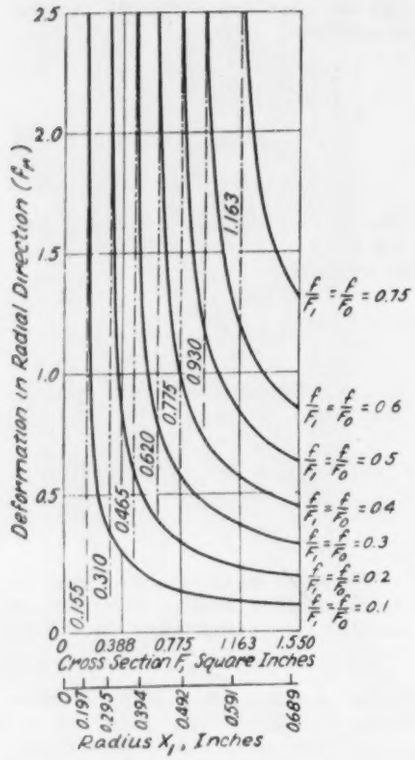


Fig. 98—Radial deformation during piercing with axial displacement (F_0=1.55 square inches)

and in the piercing process developed by Ehrhardt, in which a rectangular billet is pierced in a round die. The billet is guided by the die along its edges, so that buckling is avoided. The cross-sectional area of the mandrel is so chosen that it corresponds to the difference between billet area and die area, so that lateral yielding of the material is possible.

Diameters Are Similar

In piercing with axial displacement, the outer diameters of the billet and the hollow body are the same, so that $F_0 = F_1$; whereas, with lateral yielding of the displaced material, $F_0 = F_1 - f$. The variation of deformation in the radial direction during piercing with axial displacement, according to the relations previously stated (48), is shown in Fig. 98 for various ratios of mandrel area to the total cross-sectional area of the hollow body. As can be seen, the deformations along the inner walls of the pierced body are infinitely great, but they decrease rapidly toward the outside. Fig. 99 provides an insight into the average deformations, produced in both piercing processes, which were determined according to equation (50). For comparison, the values of average deformation, which are found from the changes of wall thickness and average diameter of the hollow body, also are included in this illustration. As will be observed, following a suggestion made by E. Siebel[12], an approximate calculation based upon these values gives too large values of deformation. In the region in question, however, the average deformation in the radial direction is given with close approximation by the equation:

$$(\phi_{r_m}) \doteq \log_e \frac{D_0}{D_1 - d} - 0.16 \quad \ldots(52).$$

The use of piercing with lateral displacement of material is limited to small outward enlargements, because the body is compressed together as soon as the axial force required for piercing exceeds the compressive resistance of the initial cross section. As will be seen, this limit already is exceeded when the area ratio of the mandrel used for piercing is $f/F_1 = 0.3$.

In order to check the theoretical considerations in the first part, a series of small scale tests was carried out with bodies of soft lead. In order to duplicate the relations which occur in practice, the chamber intended for the die in these tests was made slightly conical. Its inside diameter for a length of about 2.36 inches was 1.40 inch at the bottom, but 1.44 inch at the top, and the corresponding cross sectional area varied from 1.53 to 1.63 square inch. The mandrels used for piercing were centered, at the beginning of the test, by a ring laid on the body to be pierced. The mandrel was prevented from assuming an inclined position by a guide. Fig. 100 shows this arrangement, and indicates the method by which the mandrel was guided. The tests were made principally with flat-faced mandrels of 0.155 to 1.16 square inch area. The edge between the flat crown surface and the cylindrical lateral surface of the mandrel was rounded with a fillet of 0.08-inch radius. In addition, a mandrel with a spherical crown surface was used, to study the effect of mandrel shape. The velocity of feed of the mandrel in all tests was about 0.004-inch per second. Uniform characteristics of the soft lead bodies used for the tests were assured by the fact that the material for all tests was cut from a single billet.

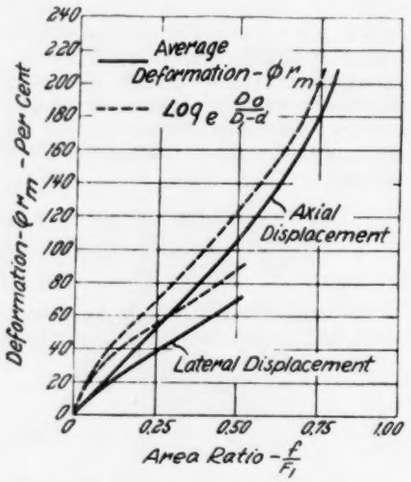

Average Deformation - ϕr_m
Log$_e$ $\frac{D_0}{D_1 - d}$
Axial Displacement
Lateral Displacement
Deformation - ϕr_m - Per Cent
Area Ratio - $\frac{f}{F_1}$

Fig. 99—Relation of average deformation (ϕr_m) to area ratio f/F_1

Round Billets Are Used

First of all, round billets of about 1.55 square inch area and 1.57 inch long were pierced with axial displacement, with flat-faced mandrels of various diameters. The force-travel diagrams are reproduced in Fig. 101, and are evaluated further in Table IX. As will be observed, an approximately constant piercing force is exerted immediately after a pressing movement of a few hundredths of an inch, with a ratio of mandrel area to die area varying from 0.1 to 0.5. The piercing force drops, toward the end of the piercing process; and finally increases steeply, under the influence of friction on the base, when the distance of the mandrel point from the base becomes less than one-fifth of the mandrel diameter. The diminution of force is attributed to the alteration of the flow of material as the mandrel point approaches the base. The deviating course of the force curve which was established in piercing with a mandrel of 1.16 square inch area is caused by the fact that in this case thin-walled material is pierced, so that the conicity of the die produces a comparatively large increase of the deformations in the course of the piercing process.

For the evaluation in Table IX, the constant piercing force during the intermediate part of the piercing tests is taken as a basis. With the large mandrel (f = 1.16 square inch),

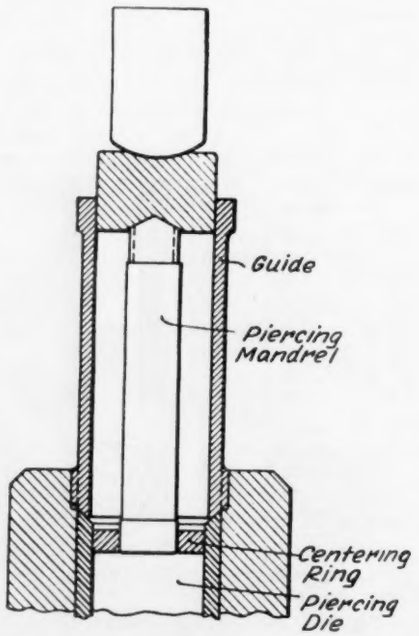


Fig. 100—Equipment for piercing tests

[12] E. Siebel: Grundsatzliche Betrachtungen zum Schragwalzverfahren; St. u. E. 47(1927)p.1685.

the piercing force occurred, according to the path of the curve, at a distance of 0.39-inch from the base: because at that position, the area ratio of the mandrel f/F_o was equal to the chosen value of 0.75. From the data contained in columns 1 to 3 regarding the dimensions of mandrel and billet, the average deformation in the radial direction was calculated according to equation (52), and was entered in column 4. From the measured force on the mandrel (column 5), the specific mandrel pressure (column 6) could be determined as the quotient of the force and the mandrel area, and the deformation resistance (column 7) could be computed according to the equation designated No. 51.

Value Practically Constant

Finally, columns 8 and 9 contain additional data on the shape of mandrel and the type of piercing. As Table IX shows, the deformation resistance of soft lead used in piercing with axial displacement with a flat-faced mandrel has a practically constant value of 5830 to 6260 pounds per square inch, independent of the area ratio of the mandrel. The mandrel pressure, p, computed from the area of the mandrel, likewise shows a nearly constant magnitude of 12,400 to 12,940 pounds per square inch within limits of the area ratio f/F_o varying between 0.2 and 0.5. As soon as the area ratio of the mandrel falls under or exceeds the limits named, however, an increase of the specific mandrel pressure is observed; which result agrees with the observations of F. J. Hofmann[73] in piercing tests on steel billets.

The extent to which this phenomenon agrees with the theoretical relations of the piercing process is as follows. If the pressure, p, per unit area is calculated according to equation (51) from the deformation resistance K_f in piercing with axial displacement, by means of the relation:

$$p = \frac{P}{f} = \frac{F_o}{f} \times K_f \times \phi r_m \ldots\ldots (53);$$

in which the average deformation in the radial direction is evaluated according to Fig. 99, the results obtained are:

f/F_o	p
0.1	$2.4 \times K_f$
0.2	$2.15 \times K_f$
0.3	$2.1 \times K_f$
0.4	$2.1 \times K_f$
0.5	$2.1 \times K_f$
0.6	$2.2 \times K_f$
0.75	$2.5 \times K_f$

[73] F. J. Hofmann: Die hydraulischen Schmiedepressen nebst einer Untersuchung uber den Vorgang beim Pressen eines Stahlstuckes in geschlossener Matrize: J. Springer, Berlin 1912.

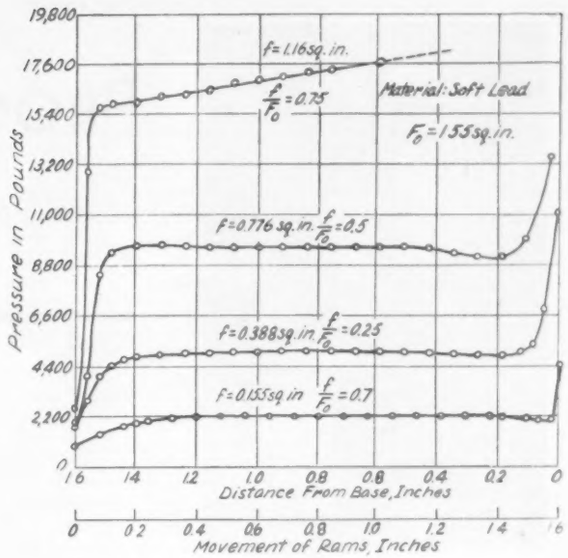


Fig. 101—Effect of area ratio on variation of force in piercing with axial displacement, using a flat-faced mandrel

(To be Continued)

Speed Plans for Convention Of Purchasing Agents

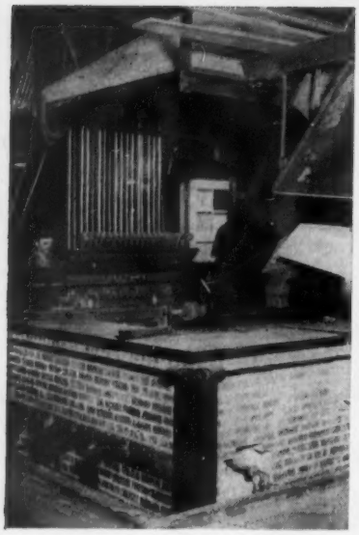
Arrangements are being pushed for the 1934 anual convention of the National Association of Purchasing Agents, to be held during the week of June 18 at Hotel Cleveland, Cleveland. A committee under the direction of R. G. Sweeney, Allyne-Ryan Foundry Co., Cleveland, is in charge of preparations for the convention which will include the usual Informashow or exhibit, 15,000 square feet of floor space being available for displays.

Table IX

Piercing Tests with Lead Bodies

1 Area of Billet F_o sq. in.	2 Area of Mandrel f sq. in.	3 Area Ratio $\frac{f}{F_o}$	3 Area Ratio $\left(\frac{f}{F_1}\right)$	4 Deformation ϕr_m per cent	5 Mandrel force*—P pounds	6 Specific mandrel pressure*—$p=\frac{P}{f}$ lbs./sq. in.	7 Deformation resistance K_f lbs./sq. in.	8 Shape of mandrel	9 Direction of displacement	10 Variation of force
1.550	0.155	0.10	(0.10)	23.0	2,205	14,220	6120	flat	axial	Fig. 101
1.550	0.388	0.25	(0.25)	53.3	5,030	12,940	6120	flat	"	
1.550	0.775	0.50	(0.50)	106.3	9,590	12,370	5830	flat	"	
1.550	1.162	0.75	(0.75)	184.8	18,070	15,500	6260	flat	"	
1.550	0.388	0.25	(0.25)	53.3	5,030	12,940	6120	flat	axial	Figs. 102 & 104
1.550	0.388	0.25	(0.25)	53.3	4,740	12,230	5690	half-round	"	
1.550	0.388	0.25	(0.25)	53.3	6,065	15,640	7260	round	"	
1.162	0.388	0.33	(0.25)	38.2	(4,963) 3,950	(12,800) 10,100	8820	flat	lateral	Fig. 104
1.162	0.388	0.33	(0.25)	38.2	(4,850) 3,950	(12,510) 10,100	8820	half-round	"	
1.162	0.388	0.33	(0.25)	38.2	(6,510) 3,793	(16,770) 9,810	8530	round	"	
1.550	0.310	0.20	(0.20)	43.3	3,882	12,510	5830	flat	axial	Fig. 104
1.550	0.310	0.20	(0.20)	43.3	4,763	15,360	6970	round	"	
1.240	0.310	0.25	(0.20)	32.2	(3,618) 2,910	(11,660) 9,390	7260	flat	lateral	
1.240	0.310	0.25	(0.20)	32.2	(4,410) 3,352	(14,220) 10,810	8390	round	"	

*Values in parentheses refer to second piercing section.



PROGRESS IN STEELMAKING

RUST arresting and rust preventing properties are claimed for a recently developed transparent compound containing materials which neutralize any existing rust or rusting agents present in the rust or pores of the base metal. A moisture-proof and air-tight film also is provided to maintain this passive condition. The materials, which eventually becomes hard and dry on the surface, retains tackiness next to the metal, thus preventing it from being affected by atmospheric changes, temperature extremes and vibration. Various kinds of paint or regular enamels may be applied directly to the rust-proof surface as a wearing coating.

♦ ♦ ♦

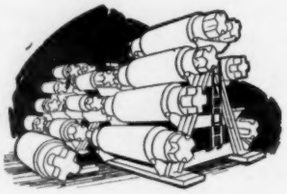
Stopper rods for open-hearth ladles are dried by a unique arrangement at a Mid-West steel works. The rods are hung in a vertical position in a tube built over a pit. A small ladle of molten slag is placed in the pit at the side of the tube. The pit then is covered with a steel plate, perforated to facilitate circulation of air over the hot slag and around the stopper rods in the tube. By this arrangement of heating the stoppers there is no charge for fuel.

♦ ♦ ♦

Generator field control of a new type has been developed for adjustable potential tandem and single-stand cold strip mills. The new control provides smooth acceleration and deceleration, and a present regulation of the threading and operating speeds.

♦ ♦ ♦

Operating the screwdowns of blooming and other type mills automatically is the purpose of a recently developed preset controller. A unit recently completed provides 863 possible stopping points at 1/16-inch minimum movement, 11 or more preset passes, and immediate change of schedule for four or more different sizes of ingots. The control is set up for the proper draft for each pass by the superintendent of the blooming mill and the operator merely pushes a single operating button repeatedly for each pass. The controller brings the screws to a stop regardless of the distance of travel, direction or of the amount of draft. The addition of a second vernier makes available 17,664 stopping positions.



DEPTH and degree of hardness are not constant over the entire length of the body of a chilled roll, according to foreign research. The hardness at the lower end relative to the casting position frequently is from 5 to 10 brinell numbers higher than at the upper end because of the higher ferrostatic pressure under which the metal solidifies at the bottom.

♦ ♦ ♦

Wire and light gage sheets and strip now may be tested for stiffness and resiliency by the use of a newly devised precision instrument. The unit will test wire from the finest filament up to 0.050-inch diameter and flat stock from foil up to a thickness of 0.010-inch. The device measures the plastic flow that takes place as the specimen is deflected.

♦ ♦ ♦

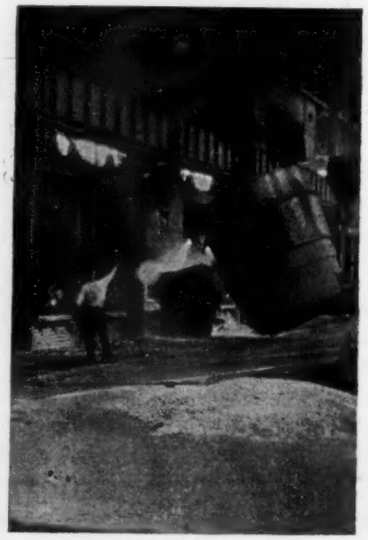
Longer life and increased protection against leaks are features of a new high-pressure union designed for steam, gas, water, air and oil lines around coke ovens and iron and steel plants. The new union has two serrated ends, one hard and the other soft,, which form four separate seats, thus providing greater protection against leakage than the single seat of the ball joint type. Maintenance also is economical. The unions can be used many times inasmuch as a single making-up will not spoil the four individual seats.

♦ ♦ ♦

Insulating block for steel mill heating furnaces with fibers in a state of flexibility now is being marketed. Although the resulting block is firm and rigid, it can be bent to conform to curves of comparatively small radius without breaking. The product when properly supported is suitable for temperatures up to 1250 degrees Fahr.

♦ ♦ ♦

Demand for a protective coating for the surface of bright wire has resulted in the development of a liquid which not only gives protection to the finish against rust, but which can be removed easily and cheaply. The coating does not interfere with the application of lacquer or japan.



NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Radiation Pyrometer—Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia, recently placed on the market a new radiation pyrometer. The instrument consists of two elements, a recorder and a radiation thermotube, each a recent development. Typical applications include slab mills where the device is used to record temperatures during rolling and after the final pass; sheet mills, recording temperatures between roll stands and before the finishing pass; and in other instances where it is desirable to obtain temperatures of moving objects.

♦ ♦ ♦

Pressure Governors — General Electric Co., Schenectady, N. Y., recently brought out an improved line of pressure governors. Although they are especially adapted for pumping station service, they can be used readily in industrial processes where it is desired to maintain a predetermined pressure. The scale of these new governors can be furnished to read water heads in feet instead of the usual pounds per square inch.

♦ ♦ ♦

Boring Machine — Stokerunit Corp., 5325 West Rogers street, Milwaukee, recently brought out a boring machine for production boring with diamond or carbide tools. A heavy bridge is bolted to supports cast integral with the bed and furnishes support for the spindles. Spindle carriers are of the unit type, adjustable as to location and two may be mounted for simultaneous operation if desired. Where changeovers are required spindles using long taper extension of various sizes can be furnished.

♦ ♦ ♦

Profile Projector—R. Y. Ferner Co., Investment building, Washington, as American agents for Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, is marketing a desk type profile projector. With the apparatus enlarged shadows of all types of shaped parts of small size can be thrown on a glass screen for comparison with drawings or tolerance charts. The projection is reflected from a mirror below a glass plate to the upper surface of the glass that is set in the top of a steel cabinet inclined at 15 degrees for convenience in viewing profile.

♦ ♦ ♦

Variable Speed Pulley—Winfield H. Smith Inc., Springville, N. Y., recently added a variable speed pulley to its line. The unit consists of two half pulleys. As the base of the motor is moved back and forth the two sections of the pulley are moved together or separated, causing the belt to run on a small or large diameter of the pulley. Variation in speed thereby is obtained.

♦ ♦ ♦

Drilling Machines — Cleereman Machine Tool Co., Green Bay, Wis., has announced through its distributor, Bryant Machinery & Engineering Co., 400 West Madison street, Chicago, a new line of heavy-duty drilling machines. Speeds as high as 1700 revolutions per minute are available in the six different sizes. There are nine changes of feed in geometrical progression. The head is a unit within itself and can be arranged in gang style of from two to six spindles. Circular, compound and square tables are among the types that can be furnished.

♦ ♦ ♦

Flexible Conduit Fitting—Pyle-National Co., 1334 North Kostner avenue, Chicago, is introducing a new water-tight, vapor-proof and explosion-proof conduit fitting that is flexible. It eliminates the bending and fitting of rigid conduit in limited spaces, withstands vibration and is tested against leaks under water at 50 pounds air pressure. The manufacturer claims that it has the mechanical features of standard flexible conduit in its ease of application.

♦ ♦ ♦

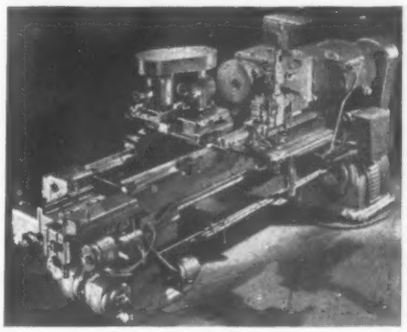
Collet Chucks—Chicago Tool & Engineering Co. Inc., 8389 South Chicago avenue, Chicago, recently announced a new development in chucks for holding straight shank drills, taps, reamers and end mills. These new collet chucks are designed for close center multiple spindle drilling and tapping. Chucks are made with morse taper shanks, threaded or tapered bodies to fit machine spindles; also with Brown & Sharpe taper shanks for milling machines and straight round shanks for turret lathes.

♦ ♦ ♦

Static Balancer — Taylor Mfg. Corp., 2330 West Clybourn street, Milwaukee, recently has developed a static balancer for balancing rotating parts. The unit is quickly set up on a drill press. Vertical adjustment of balancing cradle is made rapidly to accommodate the width of work pieces. If the amount of unbalance is too much to be drilled from one hole an automatic calculator devides the amount of unbalance into any number of holes and at any desired depth. The balancer is universal in application, that is the fulcrum is adjustable to the center of gravity of the work piece so that any width and any diameter within the range of the machine can be handled.

♦ ♦ ♦

Cam Milling Attachment—Monarch Machine Tool Co., Sidney, O., recently announced the development



of a cam milling attachment. The accompanying illustration shows the device on a 20 by 48-inch Monarch-Keller controlled lathe. Face cams 23 inches in diameter and barrel cams 12 inches in diameter may be produced on this machine. The attachment which is especially adapted to milling face cams, single or double track cams, barrel cams and other irregular contour work from a master template, consists of a subheadstock that bolts on the bed of the lathe directly in front of the regular headstock.

♦ ♦ ♦

Oxygen Recorder—C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., has placed on the market a new oxygen recorder which requires no absorption medium. A measured sample of the gas to be analyzed and a measured amount of hydrogen are drawn into separate volumeters by means of a falling column of mercury. When the mercury rises the gases are expelled from the volumeters and forced by means of a connecting tubing through an electrically-heated furnace. Here in the presence of a catalyzer the oxygen combines with the hydrogen, forming water. Balance of the gas enters the measuring chamber and a record of the

CONFORMING to its established policy of conciseness, STEEL now presents announcements and descriptions of new equipment in brief but comprehensive form. Full particulars concerning any item on this page may be obtained direct from the manufacturer.

percentage of oxygen is made on the chart. Another new development is a unit similar to the foregoing but capable of recording on one chart the percentage of carbon dioxide and oxygen. These instruments are suitable for open-hearth, glass furnace, rotary and tunnel kiln combustion control.

♦ ♦ ♦

Motorized Speed Reducers—Falk Corp., Milwaukee, is marketing a line of motor reducers including the Z all-motor type. This unit permits the use of a standard horizontal type motor without change. Other additions to the line are the new LU type that is a single reduction unit having all the advantages of the Z type; and the two-speed motor reducer which differs from the usual changeable design in that it incorporates both the speed range and the speed reduction in a single housing.

♦ ♦ ♦

Trimming Machine — Quickwork Co., St. Marys, O., has placed on the market a stamping trimming machine. Cutters revolve continuously, one cutter being moved to and from the other by actuating a lever. These cutters pierce the stamping as it revolves. Metal cutting speed provided in each machine is influenced by the nature of the stamping. For large stampings with small radii at the corners, two speeds are provided.

♦ ♦ ♦

Diesel, Gas Engine Compressors—Worthington Pump & Machinery Corp., Worthington & Harrison avenues, Harrison, N. J., has introduced a new line of diesel and gas engine compressors. In these units a compressor cylinder is mounted directly on the base of a standard vertical four-cycle diesel or gas engine. The piston of one power cylinder is replaced by a crosshead, connected by a piston rod to the compressor cylinder situated directly above.

♦ ♦ ♦

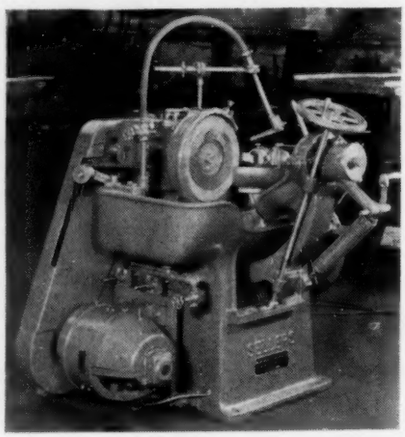
Gasoline Locomotive—Vulcan Iron Works, Wilkes-Barre, Pa., has brought out a 35-ton, 224 horsepower gasoline locomotive for heavy-duty service about steel mills, etc. The unit embodies a mechanical drive and employes an air-operated clutch as well as a clutch and gear-shift interlock. This arrangement prevents any damage to the transmission or speed-change gears.

♦ ♦ ♦

Milling Machine Attachment—Porter-Cable Machine Co., Syracuse, N. Y., has designed a new No. 6 full universal high-speed attachment for power feed milling machines. It is useful in any toolroom, job shop or manufacturing plant for performing such operations as milling internal or external cams, boring holes in jigs and fixtures without changing position of work, and milling drafts on patterns. The device also is applicable to radius, angular, T-slotting and experimental work.

♦ ♦ ♦

Tool Grinder—William Sellers & Co. Inc., 1600 Hamilton street, Philadelphia, has introduced a new No. 2A tool grinder to meet the exacting requirements for grinding cemented carbide tools. Axial oscillation of the spindle has been improved on the redesigned machine, shown herewith. The spindle with its preloaded ball bearings, is mounted



in a large bronze sleeve which is oscillated axially by a protected cam revolving at a fixed speed and arranged with a heavy coiled spring to keep the sleeve and cam in positive contact.

♦ ♦ ♦

Single-Phase Motors — Marble-Card Electric Co., Gladstone, Mich., has introduced a new line of single-phase motors. The units are known as capacitor motors and are similar in construction to a two-phase squirrel-cage motor with a condenser connected across one phase for starting, the condenser being automatically cut out of the circuit by a simple contactor when the motor comes up to speed.

♦ ♦ ♦

Slitter Saw Grinder—Hanchett Mfg. Co., Big Rapids, Mich., is marketing a new automatic grinder for sharpening and gumming small metal cutting saws singly or in gangs The grinding wheel head reciprocates on dovetail horizontal slides. Feeding of the saw is by index plate with the feed index placed at the rear of the machine away from dust and grit. A universal emery wheel dresser designed by the company is used regularly for dressing and shaping the wheel employed on the No. 21 machine.

♦ ♦ ♦

Pipe Coupling—Champion Machine & Forging Co., 3695 East Seventy-eight street, Cleveland, is marketing a new gasket-type drop forged pipe coupling which makes possible the joining of straight plain end pipe without grooving, threading, beveling or upsetting the ends. The gasket is so designed as to provide a double seal that is equally effective against either pressure or vacuum.

♦ ♦ ♦

Electric Erasing Machine—Charles Bruning Co. Inc., 102 Reade street, New York, is marketing a new electric erasing machine designed to be held in the fingers like a pencil. Thus the operator is able to maintain accurate finger control when erasing pen or pencil lines from tracings or drawings. The machine is operated by a self-contained electric motor on either 110 alternating or direct current.

♦ ♦ ♦

Timing Contactors — Automatic Temperature Control Co. Inc., 34 East Logan street, Philadelphia, recently brought out a new line of dial type timing contactors. These units are designed for opening and closing valves, for the operation of visible or audible signals, for starting or stopping of motors, or for automatically handling any electrically-operated equipment on a definite time schedule.

♦ ♦ ♦

Roller Conveyor—Mathews Conveyor Co., Ellwood City, Pa., is introducing a line of heavy-duty roller conveyors. Featured are the labyrinth seal protected and pressure lubricated bearings together with a patented gearlock axle. The latter arrangement provides a positive means of locking the inner race of the bearing and the axle so that the inner ball race cannot rotate on the axle and cause wear between these two parts. Gear teeth on the inside of the inner race and on the axle are meshed to form a positive lock.

♦ ♦ ♦

Stationary Cutting Machine—Linde Air Products Co., 30 East Forty-second street, New York, has introduced a new stationary torch cutting machine particularly suitable for cutting dies, cams, etc. With a cutting range of 44 inches longitudinally and 20 inches laterally, it does straight line cutting, angle cutting, beveling, circle cutting and intricate shape cutting. The unit can be operated with a minimum of attention from either the template end or the blowpipe end, as a hand-guided or as a machine-guided instrument.

Railroad, Structural Tonnages Join Upswing

Automobile Builders Still Pressing for Material, with Steel Rate Up to 43 Per Cent—Russian Pipe Order Developing—New Conversion Differentials Proposed

INDEPENDENT of large orders for railroad and construction materials placed last week, rolling of which will not start for several days, steelworks operations made another sharp advance, 4 points to 43 per cent, with the trend still strongly upward.

Operations at Pittsburgh, heretofore lagging this year, swept up 5 points to 26 per cent, highest since the bulge in shipments last December. Tin plate mill schedules there again increased briskly, 10 points to 70 per cent. Manifesting the broadening character of demand, however, the steelworks rate in all other districts either rose 1 to 5½ points, or held recent high levels.

Actual and prospective tonnage from major consuming lines has expanded. Demand from the automobile industry appears insatiable, and there is evidence that manufacturers not only are taking all the finished steel they can obtain for this quarter but also are seeking to accumulate stocks for the second quarter, confronted with possible price advances and labor difficulties. More sheet and strip makers are announcing March 1 as the deadline on automobile specifications, some already having placed such restriction in effect.

Railroads are more active in specifying steel products to replenish depleted stocks. The Pennsylvania's orders for material with which to build 6500 freight cars in its own shops will release shortly 72,000 tons to 21 companies, in addition to the steel recently placed for 500 freight cars.

Rail Price Arrangement Expires March 1; New York Central in Market for 40,000 Tons

Rail mill operations remain comparatively light, despite the expiration date March 1 on the $36.37½ price of rails negotiated by makers with Washington officials last fall. New York Central is to open bids on 40,000 tons Feb. 28, and Erie railroad is expected to place 30,000 tons, possibly before March 1. Chesapeake & Ohio is inquiring for 500 tons of screw spikes. Lackawanna has been granted a PWA loan to buy 25 locomotives and 500 hopper cars, and to rebuild 20 locomotives and 986 box cars.

Prospects in the structural shape market are improving steadily, with inquiries and orders accumulating for spring delivery. Featuring awards for the week, amounting to 34,751 tons, are 15,000 tons released by the Pennsylvania railroad for its electrification program on tentative orders issued before the depression set in, and 6700 tons of shapes and reinforcing material for the Choptank river bridge, Cambridge, Md.

Washington officials who looked first for railroad equipment and machine tool orders when the Russian government was recognized, now expect contracts for oil refinery equipment, tanks and line pipe to develop shortly, 40,000 tons of pipe awaiting completion of financing arrangements.

Inquiries from oil companies in the United States are heavier, and more construction work by this industry is taking form. Army engineers at Kansas City, Mo., have awarded 3500 tons of plates for a welded steel pipe line.

Proposed Conversion Differentials List Advances on Sheet Bars, Billets, Sheets, Strip

With the date for opening books for second quarter approaching, steelmakers last week were consulting with NRA authorities on new schedules, which increase the conversion differentials over semifinished. A tentative program lists advances from $2 to $3 on billets and sheet bars and from $3 to $7 on strip and sheets.

Several more blast furnaces are being made ready for operation, as pig iron shipments continue upward. Basic iron has been reduced 50 cents a ton at Neville island, Pittsburgh, to meet a local competitive situation. Scrap at Pittsburgh has risen 75 cents a ton.

In addition to the rise in steelworks operations at Pittsburgh last week, the rate advanced 5 points to 79 at Cleveland; 5½ to 42½, Buffalo; 3 to 27½, eastern Pennsylvania; 1 to 38, Chicago; and 1 to 45, Youngstown. Detroit held at 79 per cent; New England, 82; Wheeling, 69; and Birmingham, 52.

Steel ingot output in Great Britain in January was 6 per cent higher than in December, and pig iron production up 7.8 per cent, according to STEEL's London cablegram. British pig iron and steel bar prices have been advanced.

STEEL's iron and steel price composite is unchanged at $32.42; finished steel remains $51.10, while the scrap figure is up 25 cents to $11.83.

COMPOSITE MARKET AVERAGES

	Feb. 17	Feb. 10	One Month Ago Jan., 1934	Three Months Ago Nov., 1933	One Year Ago Feb., 1933	Ten Years Ago Feb., 1924
Iron and Steel Composite	$32.42	$32.42	$32.42	$31.59	$28.31	$43.49
Finished Steel Composite	51.10	51.10	51.10	49.20	45.35	67.48
Steelworks Scrap Composite	11.83	11.58	11.24	9.64	6.33	18.67

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Feb. 17, 1934	Jan. 1934	Nov. 1933	Feb. 1933
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.75	1.60
Steel bars, Chicago	1.80	1.80	1.80	1.70
Steel bars, Philadelphia	2.04	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.70	1.70	1.70	1.60
Shapes, Philadelphia	1.90	1.90½	1.90½	1.65
Shapes, Chicago	1.75	1.75	1.75	1.70
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Philadelphia	1.88	1.88½	1.88½	1.59½
Tank plates, Chicago	1.75	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	1.75	1.75	1.75	1.60
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.00
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.50
Sheets, No. 10, hot rolled, Gary	1.85	1.85	1.85	1.60
Sheets, No. 24, hot anneal., Gary	2.35	2.35	2.35	2.10
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.70
Plain wire, Pittsburgh	2.20	2.20	2.10	2.10
Tin plate, per base box, Pitts.	5.25	5.25	4.65	4.25
Wire nails Pittsburgh	2.35	2.35	2.10	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	36.00	36.00	35.00	35.00

	Feb. 17, 1934	Jan. 1934	Nov. 1933	Feb. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	19.26	15.76
Basic, valley	17.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	18.76	18.76	17.76	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	18.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.50	15.50
Southern No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2X, Eastern, del. Phila.	19.63	19.63	18.63	13.76
Malleable, valley	17.50	17.50	17.50	14.50
Malleable, Chicago	17.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.38	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	90.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$14.25	13.05	11.65	8.35
Heavy melting steel, eastern Pa.	11.75	11.62½	9.55	6.50
Heavy melting steel, Chicago	10.75	10.45	8.35	5.25
No. 1 wrought, eastern Pa.	12.75	12.65	10.15	6.50
No. 1 wrought, Chicago	10.65	9.45	8.10	5.00
Rails for rolling, Chicago	12.25	11.25	10.25	7.75
Coke				
Connellsville, furnace, ovens	3.50	3.60	3.75	1.75
Connellsville, foundry, ovens	4.25	4.25	4.25	2.50

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88c
New York, del.	2.08c
Philadelphia, del.	2.04c
Birmingham, base	1.90c
St. Louis, del.	2.07c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38c
Detroit, del.	2.45c
New York, del.	2.58c
Philadelphia, del.	2.54c
Birmingham, base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98c
Philadelphia, del.	3.14c
New York, del.	3.18c
Birmingham, base	3.00c
St. Louis, del.	3.17c
San Francisco, f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary, base	2.75c
St. Louis, del.	2.97c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Detroit, delivered	2.50c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Detroit, delivered	2.95c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.55
Long ternes, No. 24 unassorted	3.25c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del	1.98c
Philadelphia, del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birmingham, base	1.85c
Coatesville, base	1.80c
Sparrow's Pt., base	1.80c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birmingham, base	1.85c
Pacific Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birmingham, base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, del.	1.90c
Pacific Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.90c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base..	1.74c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.19c

Rail Steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.35
Cement coated nails	2.35
Galvanized nails, 15 gage and coarser	4.35c
Do., 16 gage and finer..	4.85c

(Per pound)

Polished staples	3.05c
Galvanized fence staples	3.30c
Barbed wire, galv.	2.85c
Annealed fence wire	2.35c
Galvanized fence wire	2.70c
Woven wire fencing (base column, c.l.)	$60.00
Plain wire, 6-9 gage to mfg. trade	2.20c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base	
1⅛-inch	3.40c
1¼ to 1½-inch	2.90c
1⅝ to 1⅞-inch	2.75c
1¹⁵⁄₁₆ to 2⅞-inch	2.60c
2¹⁵⁄₁₆ to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton	2.45c
Bethlehem	2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 carbon base plus extras	

Strip and Hoops □

Hot strip to 23¹⁵⁄₁₆-in. Pittsburgh	1.75c
*Do., Chicago	1.80c
Do., del. Detroit..	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
*Do., Chicago	1.90c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Standard rails, mill	$36.37½
Relay rails. Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag	
Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET Screws

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c.l., Pittsburgh, Cleveland	2.75c
Struc., c.l., Chicago	2.85c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts:; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pittsburgh	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Blk.	Gal.
Steel		
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel		
2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel	
⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
Iron	

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. l. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts. under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron; Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	41
2½—2¾	34	4	46
3	38	4½, 5, 6	43

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled

2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs. to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Pet Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birm.	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base....$90.00

Six to 24-inch, fittings base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forgings, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Young.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Young.	26.00

WIRE RODS

Pitts., Cleveland	36.00
Chicago	37.00

SKELP

All grades, Pitts., and Chicago	1.60c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.50
Connellsville fdry.	4.25
Connel. prem. fdry.	5.00- 5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connellsville basis	6.00
Portsmouth, ovens, Connellsville basis	6.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.
Tank lots

	Spot
Pure benzol	$0.205
90 per cent benzol..	$0.205
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lb.)	0.178c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$18.50	$19.00	$18.00	$19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	.....	18.00	.....
From Swedeland, Pa., del. to Philadelphia	19.26	19.76	18.76	.....
From Bethlehem, del. to Brooklyn	20.77	21.27	.....	.....
From Bethlehem, del. to Newark, N. J.	19.99	20.39	.....	.....
Basing Point:				
Everett, Mass.	18.50	19.00	18.00	19.50
From Everett, del. to Boston	19.00	19.50	18.50	20.00
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O.	19.26	19.26	18.76	19.76
Basing Point:				
Jackson, O.	19.25	19.25	18.75	.....
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	18.00	18.50	17.50	.....
Basing Point:				
†Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham, del. to:				
Boston	18.62	.....	18.12	.....
Newark, N. J.	19.58	.....	.....	.....
Brooklyn, N. Y.	20.39	.....	.....	.....
Baltimore	19.02	.....	18.52	.....
Philadelphia	18.88	.....	18.38	.....
Cleveland	17.62	.....	17.50	.....
Cincinnati	18.13	.....	17.51	.....
Chicago	*17.72	.....	17.60	.....
St. Louis	17.62	.....	17.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. *Over 0.70 phos.

Basing Point:

Provo, Utah	16.50

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing point: Johnson City, Tenn.—$23.00

Philadelphia, standard and copper bearing	24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson county, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore □ □

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%	7.00
Chrome ore 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00
MALLEABLE BUNG BRICK all bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth, Meeting, Pa., Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar 85-5 □ □

Washed gravel, duty paid, tide, gross ton	$21.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.75-15.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom., fur., spot†	26.00
Ferrosilicon, 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent.	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c Conn. copper

Sheets	
Yellow brass (high)	13.75
Copper, hot rolled	15.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00
Tubes and Pipes	
High yellow brass	16.25
Seamless copper	16.25
Rods	
High yellow brass	12.25
Copper, hot rolled	12.25
Anodes	
Copper, untrimmed	12.75
Wire	
Yellow brass (high)	14.25

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Chicago	4.37½-4.87½
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	6.12½- 6.25
Chicago, No. 1	5.75- 6.00
Cleveland	5.50- 5.75
St. Louis	5.75- 6.00
Composition Brass Borings	
New York	4.25- 4.50
Light Copper	
New York	5.25- 5.50
Chicago	4.50- 4.75
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.50- 2.75
Cleveland	3.00- 3.25
Lead	
New York	3.00- 3.25
Cleveland	2.75- 3.10
Chicago	2.75- 3.00
St. Louis	3.10- 3.25
Zinc	
New York	2.25- 2.50
Cleveland	2.25
*Chicago	2.25- 2.50
St. Louis	2.50- 2.75
Aluminum	
Clips, soft. Cleve.	13.50-14.00
Borings, Cleveland	6.00- 7.00
*Mixed, cast Cleve.	10.50-11.00
*Mixed, cast, St. L.	10.50-11.00

Secondary Metals □

Brass ingot, 85-5-5-5	8.25
*Remelt al. No. 12	15.00-16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dealers	7.25- 7.50
Buffalo, No. 1	11.75-12.25
Buffalo, No. 2	10.25-10.75
Chicago	10.50-11.00
Cleveland, No. 1	11.00-11.50
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa.	11.50-12.00
Eastern Pa., No. 2	9.50-10.00
Federal, Ill.	8.75- 9.25
Granite City, Ill.	9.00- 9.50
N. Y., deal. R. R.	8.75- 9.00
N. Y., deal. No. 2	7.50
Pittsburgh, No. 1	14.00-14.50
St. Louis, No. 1 del.	10.50-11.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.25-10.75
Chicago, factory	9.50-10.00
Cleveland	10.00-10.50
Detroit	9.50-10.00
E. Pa., new mat.	10.50
Pittsburgh	13.75-14.25
Valleys	13.00-13.50

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	5.75- 6.25
Cleveland	7.50- 8.00
Pittsburgh	12.25-12.75
St. Louis	5.75- 6.25

SHEET CLIPPINGS LOOSE

Chicago	5.50- 6.00
Cincinnati	5.00- 5.50
Detroit	6.50- 7.00
St. Louis	4.50- 5.00

STEEL RAILS, SHORT

Birmingham	10.50-11.00
Boston, dealers	7.25- 7.50
Buffalo	12.50-13.00
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.00-11.50
Detroit	10.50-11.00
Pitts., (open-hearth 3 ft. and less	15.50-16.00
St. Louis	12.50-13.00

STOVE PLATE

Birmingham	6.50- 7.50
Boston, dealers	4.75- 5.00
Buffalo	9.50-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Detroit, net	6.00- 7.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	5.50- 6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	12.00-12.50
Chicago, springs	12.50-13.00
Eastern Pa.	14.00-15.00
Pittsburgh	15.50-16.00
St. Louis	11.50-12.00

ANGLE BARS—STEEL

Chicago	11.75-12.25
St. Louis	10.00-10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa. crops	14.00-14.50
Pittsburgh, billet, bloom crops	16.50-17.00
Pittsburgh, sheet bar crops	16.50-17.00

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis	10.00-10.50

SHOVELING STEEL

Chicago	10.50-11.00
St. Louis	8.25- 8.75

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.00- 9.50
Buffalo, No. 2	11.75-12.25
Chicago, No. 1, net	9.25- 9.75
Chicago, No. 2	10.50-11.00
Cincinnati, No. 2	8.50- 9.00
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal	8.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	8.75- 9.25

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	10.00
New York, dealers	5.25- 5.50

BUSHELING

Buffalo, No. 1	10.25-10.75
Chicago, No. 1	9.25- 9.50
Cinci., No. 1 deal	6.00- 6.50
Cincinnati, No. 2	2.50- 3.00
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1 new	8.25- 8.75
St. Louis, No. 1	6.50- 7.00
Valleys, new No. 1	13.00-13.50

MACHINE TURNINGS

Bimingham	4.50- 5.00
Boston, dealers	3.25- 3.50
Buffalo	7.00- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers	4.75- 5.25
Cleveland	8.50- 8.75
Detroit	6.50- 7.00
Eastern Pa.	7.00- 7.50
New York, dealers	3.25- 3.50
Pittsburgh	10.25-10.75
St. Louis	5.25- 5.75
Valleys	10.25-10.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	1.75- 2.00
Buffalo	7.50- 8.00
Cincinnati, dealers	4.75- 5.25
Cleveland	8.75- 9.25
Detroit	7.25- 7.75
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.50
Pittsburgh	8.00- 8.50

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	8.50- 9.00
Detroit	7.25- 7.75
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	8.25- 8.75
St. Louis	5.25- 5.75

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.25- 6.75
Chicago, net	7.00- 7.50
Cincinnati	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York, dealers	5.00- 5.50
St. Louis	5.50- 6.00

FORGE FLASHINGS

Boston, dealers	5.00- 5.25
Buffalo	9.50-10.00
Cleve., over 10 in.	9.25- 9.75
Detroit	7.75- 8.25

FORGE SCRAP

Boston, dealers	4.25- 4.50
Chicago, heavy	11.00-11.50
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	9.75-10.25

AXLE TURNINGS

Boston, dealers	3.50- 3.75
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.00- 9.50
Cleveland	10.00-10.50
Eastern Pa.	11.00
St. Louis	6.00- 6.50

STEEL CAR AXLES

Birmingham	10.00-11.00
Boston, ship. point	8.00- 8.50
Buffalo	11.00-11.50
Chicago, net	11.50-12.00
Eastern Pa.	14.00
St. Louis	11.50-12.00

SHAFTING

Boston, ship. point	10.75-11.00
Eastern Pa.	16.25-16.50
New York, dealers	11.50-12.00
St. Louis	9.00- 9.50

CAR WHEELS

Birmingham, iron	8.75- 9.25
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	11.50-12.00
Chicago, rolled steel	12.00-12.50
Cincinnati, iron	8.25- 8.75
Eastern Pa., iron	12.00-12.50
Eastern Pa., steel	14.00-15.00
Pittsburgh, iron	11.50-12.00
Pittsburgh, steel	15.50-16.00
St. Louis, iron	8.75- 9.25
St. Louis, steel	11.50-12.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 2	6.00- 6.25
Boston, tex. con.	10.50-11.00
Buffalo, cupola	11.00-11.50
Buffalo, mach.	12.00-12.50
Chicago, agri. net	8.50- 9.00
Chicago, mach. net	9.00-10.00
Chi., railroad net	9.00- 9.50
Cinci., mach. cup	9.00- 9.50
Cleveland, cupola	11.00-11.50
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.50
Pittsburgh, cupola	12.75-13.25
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.75- 9.25
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	6.50- 6.75
Buffalo, break.	8.50- 9.00
Cleveland, break.	8.00- 8.50
Detroit, break.	8.00- 8.50
Detrait, auto net	10.00-10.50
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal.	7.25- 7.75
N. Y., break. deal.	7.25- 7.75
Pittsburgh	11.75-12.25

MALLEABLE

Boston, consum.	12.00-12.25
Buffalo	12.00-12.50
Chicago, R. R.	11.75-12.25
Cinci., agri. del.	8.00- 8.50
Cinci., R. R. del.	8.50- 9.00
Cleveland, rail.	11.50-12.00
Detroit, auto	9.50-10.00
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.75-11.50
Boston, dealers	7.25- 7.50
Buffalo	10.50-11.50
Chicago	12.00-12.50
Eastern Pa.	13.00
New York, dealer	7.50- 8.00
St. Louis	12.00-12.50

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	11.50-12.00
Chicago	12.50-13.00
Eastern Pa.	14.00-15.00
Pittsburgh	15.50-16.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead, N. Y.	Lead, East St. L.	Zinc, St. L.	Aluminum 98-99%	Antimony, Spot, N. Y.	Ingot Nickel
Feb. 10	8.00	8.12½	7.75	51.60	51.90	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 12—Holiday											
Feb. 13	8.00	8.12½	7.75	51.60	51.75	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 14	8.00	8.12½	7.75	51.50	51.65	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 15	8.00	8.12½	7.75	51.62½	51.75	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 16	8.00	8.12½	7.75	52.10	52.25	4.00	3.90	4.40	*22.90	7.15	35.00

*Nominal quotation. Market range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore* ..	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga..	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
San. Fran.	3.55c
Baltimore*	2.75c
Baltimore* ...	2.60c
Chattanooga..	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	
Boston 2.75c-3.25c	
Buffalo	1.95c
Chattanooga..	3.26c
Chicago 1.95c-2.10c	
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl...	3.10c
New Orleans	3.00c
New York	3.17c
Philadelphia..	2.62½c
Pitts., plain...	3.00c
Pitts., twisted squares	3.12½c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young. 2.30c-2.60c	

SHAPES	
Baltimore*.....	2.75c
Boston††	3.07c
Buffalo	3.20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3 25c
Tulsa	3.50c

PLATES	
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3 20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker.	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Det., ⅜-in.....	3.10c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore* ..	2.95c
Boston††	2.90c
Buffalo	3.10c
Chattanooga..	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles..	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis 3.19c-3.36c	
St. Paul	3.45c
Tulsa	3 70c

NO. 24 BLACK	
Baltimore*†..	3.50c
Boston (g) ..	3.75c
Buffalo	3 25c
Chattanooga..	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles..	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**..	3.40c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore*†..	3.75c
Buffalo	4.00c
Boston (g) ..	4.35c
Chattanooga..	4.61c
Chicago 4.20c-4.30c	
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	4.40c
Los Angeles..	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.** 3.90c-4.20c	
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Phila.*†	4.00c

BANDS	
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.51c
Chicago	3 20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅜-in. and lighter	3.28½c
Houston	3.25c
Los Angeles..	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia..	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3 44c

HOOPS	
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia..	3 30c
Pittsburgh	3.60c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore (c)	3.71c
Boston 4.00c-4.50c	
Buffalo (h)....	3.55c
Chattanooga*	4.06c
Chicago (h)..	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)..	5.95c
New Orleans	4.25c
New York...3.92c-4.42c	
Philadelphia..	3.73c
Pittsburgh(h)	3.45c
Portland (f)..	4.75c
San Fran. (f)	5.95c
Seattle (f)....	4.75c
St. Paul	3.20c
St. Louis.....	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)..	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia..	4.00c
New York.....	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing. 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus. quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 15

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	£ s d
Foundry, 2.50-3.00 Silicon.	$14.80	2 18 6	$8.88	1 16 6
Basic bessemer.....	13.66	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	15.18	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets.....	$27.83	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	39.47	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails.....	$39.22	7 15 0	$26.77	5 10 0
Merchant bars.....	1.63c	7 5 0	.72c	3 5 0
Structural shapes.....	1.66c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.....	1.80c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.....	2.08c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr...	2.53c	11 5 0	1.54c	7 0 0
Bands and strips.....	1.80c	8 0 0	.85c	3 17 6
Plain wire, base.....	2.19c	9 15 0	1.18c	5 7 6
Galvanized wire, base.....	2.49c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base.....	2.70c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.....	$ 4.17	0 16 6	....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.....	$18.81	3 2 6(a)	$13.08	200	$14.12	305	$24.69	63
Basic bessemer pig iron....	16.45	3 5 0(a)*	12.10	185	13.43	290	27.24	(b)69.50
Furnace coke.....	4.55	0 18 0	7.85	120	5.09	110	7.54	19.25
Billets.....	27.83	5 10 0	26.49	405	20.37	440	37.85	96.50
Standard rails.....	1.86c	8 5 0	2.10c	700	2.31c	1,100	2.35c	132
Merchant bars.....	1.72c	7 12 6	1.68c	560	1.16c	550	1.96c	110
Structural shapes.....	1.97c	8 15 0	1.65c	550	1.16c	550	1.91c	107.50
Plates, †¼-in. or 5 mm.....	1.91c	8 10 0	2.10c	700	1.47c	700	2.26c	127
Sheets, black.....	2.31c	10 5 0§	2.55c	850‡	1.63c	775‡	2.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	2.87c	12 15 0	4.35c	1,450	3.15c	1,500	6.59c	370
Plain wire.....	2.08c	9 5 0	3.39c	1,130	2.31c	1,100	3.08c	173
Bands and strips.....	2.36c	10 10 0	1.95c	650	1.47c	700	2.26c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 42

Chicago — While steel bar specifications have shown a fairly large increase since a month ago, more substantial gains in shipments are seen for the near future in view of the sharp expansion in automotive needs. Farm implement manufacturers gradually are increasing requirements of iron and steel bars, the comparison with consumption a year ago being particularly favorable. Shafting manufacturers have increased requirements and miscellaneous consumers are placing steady or heavier specifications. Announcement of second quarter price is awaited with no intimations made of changes from the current 1.80c, Chicago, market.

Cleveland—Demand for carbon and alloy steel bars is the most active of heavy finished steel products, tonnage coming mainly from automobile manufacturers. Some good specifications for rim stock were noted during the week. The average size of orders of miscellaneous descriptions to makers here has increased. Soft steel bars are 1.80c, base, Cleveland.

Pittsburgh—Buying of bars by automobile manufacturers is heavy with recent orders about equally divided between carbon and alloy grades. The general manufacturing trade is rather slow to inquire on its bar commitments. The alloy bar base continues 2.45c, Pittsburgh, and carbon steel bars 1.75c, base Pittsburgh.

Boston — Commercial steel bar buying is unchanged with possibility of slightly more activity among machinery builders and forging shops. At 2.15c, delivered, Boston, prices are firm.

New York—With specifications from railroads beginning to stimulate a generally quiet market for steel bars, demand shows some increase. No change in prices for second quarter is expected.

Philadelphia — Commercial steel bar producers are expected to open books March 1 for second quarter at unchanged prices. Definite indications are likely to be seen in the next few days, for any changes contemplated would probably be filed with the American Iron and Steel institute 10 days or so in advance of the effective date. The Pennsylvania's distribution of bars was outstanding in the week's trading; in fact, there was little buying otherwise.

Surface Combustion Corp., Toledo, O., has installed a carbottom annealing furnace in the Lima, O., plant of the Ohio Steel Foundry, heated with natural gas.

Plates

Plate Prices, Page 42

Pittsburgh — United States engineers at Kansas City, Mo., have awarded 3500 tons of ¾-inch plates to be butt-welded into 27,500 feet of 28-inch pipe to McClintic-Marshall Corp., Bethlehem, Pa. Welded pipe is to be in 20 to 40-foot lengths. Other important plate work in the market includes heavy tonnages for railroad orders from the Van Sweringen lines.

A fairly good volume of private barge work is active but barge builders have had no orders of this nature is because they are unwilling to accept long-term financing. Therefore, government work gives barge estimating departments the most work at present. Vicksburg, Miss., closes March 1 on a 150-ton steel barge. St. Louis engineers close Feb. 26 on six 40 x 9 x 5 foot steel launches. Chicago engineers open bids March 1 on two 28 x 7 x 2 foot steel hull work boats.

The plate market holds at 1.70c, Pittsburgh, for the remainder of this quarter.

Cleveland — Formal release of materials and specialties for the Van Sweringen lines' freight cars, coaches and locomotives, recently awarded, is awaiting signed approval by the interstate commerce commission of the PWA loan already authorized. The commission has indicated its sanction, and while it was expected last week, it may not be signed until early this week. In the meantime, allocations have been tentatively made, and the Cleveland plate mill is scheduled to receive plates for the locomotives and tenders. Miscellaneous plate orders are light.

Chicago—The outlook for heavier plate demand continues to improve. In addition to substantial tonnages for railroad car construction which is expected to start shortly, other plate outlets are more active. Inquiries from oil companies for miscellaneous construction and refinery improvement work are heavier. Dredges and pontoons pending for the United States engineer office. Kansas Ctiy, Mo., will take about 1500 tons of plates and shapes.

Boston—There is broader demand for plates and of the heavier hot-rolled products, plates are most active. Contributing to the demand is better buying by railroads, industrial users, and some boiler shops, while miscellaneous shipments have gained slightly. Prices are firm and unchanged.

New York—Plate demand is slightly more diversified and railroad releases are the principal factor in better mill operation. Prices will be reaffirmed for second quarter.

Philadelphia—Eastern plate mills generally shared in the heavy distribution last week by the Pennsylvania. Precisely the total tonnage involved in the Pennsylvania's plate purchases has not yet been revealed. Sellers are looking for releases against this business to begin within the next two or three weeks. Miscellaneous buying is light.

Contracts Placed

3500 tons, for 27,500 lineal feet 28-inch butt weld, ¾-inch wall welded steel pipe in 12 to 40 foot lengths for army engineers, Kansas city, Mo., to McClintic-Marshall Corp., Bethlehem, Pa.

298 tons, 16-inch, ¼-inch plate, pipe line, East Bay municipal utility district, Oakland, Calif.; bids Feb. 14.

200 tons, tanks for Progressive brewery at Oklahoma City, Okla., to American Tank & Equipment Co., Oklahoma City, Okla.

160 tons, 24-inch, ⅜-inch plate, welded pipe line, Escondido Mutual Water Co., Escondido, Calif.; bids opened.

150 tons, tanks, east Texas, Phillips Petroleum Co., to Graver Tank & Mfg. Corp., East Chicago, Ind.

100 tons, dump bodies for garbage department, Sacramento, Calif.; Western Pipe & Steel Co., San Francisco, low.

100 tons, elevated steel tank, Hartsville, S. C., to R. D. Cole Mfg. Co., Newman, Ga.

Contracts Pending

250 tons, water tank, Newport News, Va., to Chicago Bridge & Iron Works, Chicago.

150 tons, one barge for Vicksburg, Miss., engineer, 120 x 60 x 7 feet; bids March 1.

Sheets

Sheet Prices, Page 42

Cleveland—Specifications from automobile manufacturers continue heavy, supporting mill operations here and in an adjacent lake district at capacity. Shipments are wanted promptly, and the same manufacturers also are stocking up in anticipation of heavier production schedules. Mill interests are seeking to avoid taking more than they can deliver by March 31. One producer placed a deadline on automobile sheet specifications Feb. 11, and others say they will not accept any after March 1. The Newton Steel Co., Newton Falls, O., plant will re-

sume operations Feb. 19 at 50 per cent, mainly on automotive sheets. Demand from makers of household utilities is well sustained. Prices are unchanged.

Pittsburgh—With buying still centered in wide cold-rolled sheets for the automobile trade, some of the other sheet finishes seem destined soon to come in for their share of the market's improvement. Rural demand for black and galvanized sheets will appear shortly. Among companies in the Pittsburgh district sharing in the Pennsylvania's orders, which were placed Feb. 14, were American Sheet & Tin Plate Co., Apollo Steel Co., and Weirton Steel Co. Sheet prices are firm. Currently, all sheet mill operations are around 55 per cent, a leading producer here being at 40 per cent.

Chicago—Producers are shipping automotive material at a capacity rate but business in other descriptions is relatively less active. Farm implement manufacturers gradually are increasing their sheet needs, while the electrical refrigerator industry is operating at a seasonally high rate.

Boston—Railroads and miscellaneous buying is heavier, but aggregate tonnage has shown little improvement.

New York—An increase in contract specifications is reported by sheet sellers here. This is attributable primarily to advancing mill schedules. Prices on cold-finished sheets are exceptionally strong.

Philadelphia—The next few days should reveal the trend of sheet prices for second quarter, as sellers, under the code, will be permitted to open their books for second quarter March 1. Except for sheets placed last week by the Pennsylvania railroad, buying here has been light.

Buffalo—Buffalo district sheet mills continue to operate at 80 per cent, and have sufficient business on hand to continue at or near this rate throughout this quarter.

Cincinnati—Steady buying for automobile interests, with improved demand from other sources lifted sheet mill operations above 70 per cent during the week.

Birmingham, Ala.—Sheet mills are doing fairly well, with prospects brighter for agricultural sections.

Cold Finished

Cold Finished Prices, Page 43

Pittsburgh—Volume of buying of cold-finished steel bars diminished last week following a heavy week from the standpoint of specifications. Most present buying is automotive. With the market at 2.10c, Pittsburgh, on cold-drawn bars it is unlikely any change for second quarter will be made unless the market on hot-rolled bars is revised. Following upon the presence of three Ohio mills in the precision-round bar market, a Pittsburgh producer is understood to be making tests now preliminary to entering the field.

Railroads

Track Material Prices, Page 43

Closing on considerable more steel than originally specified for its opening of Feb. 5, the Pennsylvania railroad distributed contracts for 72,000 tons of bars, plates, shapes, sheets, wheels and axles last week among 21 companies. This material is for use in the construction of 6500 freight cars in company shops. As tonnage is only now being distributed for the 500 freight cars for which steel orders were placed several weeks ago, it is generally believed in the trade that it may be two or three weeks at least before releases will be issued against this new tonnage, which cost in excess of $3,000,000.

The companies participating in the distribution of 72,000 tons were: Alan Wood Steel Co., Conshohocken, Pa.; American Sheet & Tinplate Co., Pittsburgh; Apollo Steel Co., Apollo, Pa.; Armco Railroad Sales Co., Butler, Pa.; Bethlehem Steel Co., Bethlehem, Pa.; Byproducts Steel Corp., Coatesville, Pa.; Carnegie Steel Co., Pittsburgh; and Central Iron & Steel Co., Harrisburg, Pa.

Others were Corrigan, McKinney Steel Co., Cleveland; Jones & Laughlin Steel Corp., Pittsburgh; Lukens Steel Co., Coatesville, Pa.; Otis Steel Co., Cleveland; Phoenix Iron Co., Phoenixville, Pa.; Republic Steel Corp., Youngstown, O.; Sharon Steel Hoop Co., Sharon, Pa.; Superior Steel Corp., Pittsburgh, Pa.; Weirton Steel Co., Weirton, W. Va.; West Leechburg Steel Co., West Leechburg, Pa.; Wheeling Steel Corp., Wheeling, W. Va.; Worth Steel Co., Claymont, Del.; Youngstown Sheet & Tube Co., Youngstown, O.

The Pennsylvania is expected to distribute orders shortly up to 2000 tons of rivets and on a round tonnage of bolts and nuts for these cars. This road has placed 28,000 brake beams with the Pressed Steel Car Co., Pittsburgh, and Chicago Railway Equipment Co., Chicago, involving about 1400 tons.

Chesapeake & Ohio is inquiring for 500 to 600 tons of track spikes. The Erie is expected to close in a short time on its inquiry for 30,000 tons of rails which has been pending since December.

New York Central will open bids Feb. 28 on 40,000 tons of rails and a tonnage of accessories. No date has been set for bids on 10,500 tons of miscellaneous steel in connection with which the road is said to be supplying mileages to the American Iron and Steel institute for calculation of freight allowances.

Rail prices named under agreement between makers and the government expire March 1, and while mills have not yet taken action on prices beyond that date, railroads manifest little concern.

Lehigh Valley is releasing a substantial tonnage of heavy products for its car repair program. Boston & Albany has placed 735 tons of tie plates with Carnegie Steel Co., Pittsburgh, and 100 tons of spikes with Jones & Laughlin Steel Corp., Pittsburgh.

Delaware, Lackawanna & Western has been allotted $4,666,000 for the purchase of 25 locomotives and 500 hopper cars and for rebuilding 20 locomotives and 986 box cars.

Car Orders Placed

Union Pacific, one six-car and two nine-car articulated passenger trains, to Pullman Car & Mfg. Corp., Chicago.

Car Orders Pending

Delaware, Lackawanna & Western, 500 steel hoppers; PWA loan granted.
Western Maryland, 20 or 25 all-steel cabooses; bids asked.

Locomotives Pending

Delaware, Lackawanna & Western, 25 locomotives; PWA loan granted.

Rail Orders Pending

New York Central, 40,000 tons, accessories additional; Clayton act opening Feb. 28.

Wire

Wire Prices, Page 43

Pittsburgh—Effects of the heavy December rate of shipments of wire products are still felt and buying in the market is confined to fill-in requirements. The market is $2.35 base on nails, 2.20c on plain wire and $60 on woven wire fencing, these prices to be continued for the balance of this quarter. Through last week, trade opinion was divided on the second quarter market for wire products.

Copperweld Steel Co., Glassport,

Pa., has been awarded a contract for an unstated tonnage of noncorrosive wire fabric by the New Orleans engineers, on a bid of $54,300. American Cable Co., Wilkes Barre, Pa., was low at $590 for 1246 feet, and Wire Rope Corp. of America, New Haven, Conn., was low at $1422 for 2812 feet, on plow steel wire rope when bids were opened Feb. 13 by the army engineers, Pittsburgh.

Cleveland—Each week so far this year wire tonnage booked at Cleveland has increased over the preceding week. This improvement is due mainly to automobile requirements, but general manufacturing orders also are expanding. Second quarter prices have not been determined.

Chicago—Wire demand is increasing and the outlook is becoming more favorable. Manufacturers' wire is moving in larger lots to the automotive industry and miscellaneous consumers, while a slight gain is noted in jobbers' purchases. No decision has been announced on second quarter prices, the market continuing $2.40, Chicago, for wire nails and 2.25c for plain wire.

Boston—Recent gains in demand for wire, notably specialties, have been held by New England wire mills, several noting an increase in incoming business. Round wires for manufacturing are fairly active and plain bright wire is unchanged at 2.30c, Worcester, Mass.

New York—The wire trade here is inclined to the belief that there will be no change in prices when sellers open books for second quarter, March 1, except possibly for some minor revisions in specialties. Jobber releases are light and sellers report only modest specifications from manufacturers.

Pipe

Pipe Prices, Page 43

Pittsburgh—Heavy tonnages of pipe for the 12,725 freight cars, which the Van Sweringen lines recently placed, have not yet been bought. It is stated that each car will require several hundred feet of tubular products. Although pipe discounts hold unchanged, a possible change on seamless as well as line pipe and other oil country goods may be made shortly. Currently, buying is mostly in small lots.

With the matter of Russian credits becoming clarified, interest has been reawakened in the 40,000-ton inquiry for pipe line for the Soviet, active here several weeks ago. It is indicated that this 40,000-ton initial requirement will be expanded later into orders covering 4000 miles of oil and gas pipe lines.

Cleveland—Elyria, O., has applied for a federal loan toward construction of a 36-inch water main, requiring approximately 6000 tons of cast pipe. Municipal work and building construction in northern Ohio are slow, as reflected in light demand for pipe. Steel & Tubes Inc., subsidiary of the Republic Steel Corp., is taking bids for a new mill building at Cleveland.

Chicago—Cast pipe orders are light considering the heavy tonnage involved in prospective work for various municipalities in the Middle West. Producers anticipate heavier releases in the near future but point out that they would be unable to fill orders were a majority of present projects to be started simultaneously. The low bidder has been announced on 1250 tons of 12-inch pipe for a Cook county infirmary.

Boston—Several thousand tons of cast pipe for Boston, Worcester, Mass., and Warwick, R. I. have been bought, while Norwalk, Conn., purchased 425 tons from the Burlington, N. J., foundry. A fair volume is up for bids with financing arranged. Prices on cast pipe are the firmest in a long period.

New York—Three foundries, two at Birmingham, Ala., are low on various items included in 6000 tons of cast pipe for Porto Rico. Demand in this district is light, including several hundred tons for state hospital and CWA work.

Cast Pipe Placed

2000 tons, 30-inch, Newport News, Va., to Lynchburg Foundry Co., Lynchburg, Va.; Virginia Engineering Co., Newport News, general contractor.

425 tons, 3 to 12-inch, Austin, Tex., to United States Pipe & Foundry Co., Burlington, N. J.; Guiton Morgan, Austin, general contractor.

400 tons, pipe and fittings, 4 to 20-inch, Central Islip hospital, New York, to Warren Foundry & Pipe Co., Phillipsburg, N. J.

390 tons, 16-inch, Norwalk Conn., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1250 tons, 12-inch, for Cook county, Illinois, infirmary; Lynchburg Foundry Co., Lynchburg, Va., low.

628 tons, 16-inch, class B or 200, East Bay municipal utility district, Oakland, Calif.; bids Feb. 4, alternate bids on welded steel pipe.

456 tons, 4 to 8-inch, class 150, Morgan Hill, Calif.; bids March 1.

384 tons, 8 to 12-inch, class 150, Fresno, Calif.; bids opened.

Unstated tonnage, 4250 feet of 10-inch, 4100 feet of 8-inch, 6600 feet of 6-inch, for extension to waterworks, McKinney, Tex., to Koch & Fowler, Central Bank building, Dallas, Tex., engineers; bids soon.

Unstated tonnage, 720 feet of 8-inch, 8640 feet of 6-inch, 580 feet of 4-inch, also hydrants, for waterworks and sewers, Rockwell, Tex., Koch & Fowler, Central Bank building, Dallas, Tex., engineers; bids soon.

Unstated tonnage, 1884 feet of 8-inch, 7640 feet of 6-inch, also specials, Folkston, Ga., waterworks improvement; J. B. McCrary Engineering Corp., Atlanta, engineer.

Unstated tonnage, 2900 feet, 6-inch, waterworks, Rockmart, Ga.; L. C. Hulsey, engineer; PWA project.

Unstated tonnage, 15,000 feet, 8-inch, 1620 feet, 6-inch, also valves and hydrants, waterworks, Cooper, Tex.; W. F. Hicks, engineer, Paris, Tex.

Steel Pipe Pending

3720 tons, 28-inch welded, government project, Fort Peck, Mont.; McClintic-Marshall Corp., Bethlehem, Pa., low.

Strip Steel

Strip Prices, Page 43

Pittsburgh — Nonintegrated strip producers were being sounded last week on the proposal to advance billets $1 or $2 a ton for the second quarter but this was not well received in view of the recent cut in hot-rolled strip steel at Chicago and the probability that second quarter strip prices would continue unchanged at 1.75c, Pittsburgh. The cold-rolled strip market holds 2.40c, base, Pittsburgh or Cleveland.

Cleveland—Automotive specifications are filling up strip mills, but makers have not yet found it necessary to place a deadline on March specifications, as some sheet mills have done. Prices are firm.

Chicago—Automotive requirements are swelling strip steel shipments, particularly cold-rolled. Second quarter prices have not been announced, the market on hot strip now being 1.80c, Chicago, with cold-rolled strip 2.40c, Pittsburgh-Cleveland.

Boston—Improvement in demand for strip is slow as automobile partsmakers and other industrial users take more material. Strip mills in only a few instances have increased operations. Prices are firm at 2.60c, Worcester, Mass., and most shipping orders are for quick delivery, mills being able to meet this demand.

New York—Importers have increased prices on foreign steel hoops $6 per ton, to 2.65c, duty paid, New York.

Philadelphia—Strip sales are spotty with any price changes to be made for second quarter likely to be announced within the next few days. Some trade leaders look for little change.

Shapes

Structural Shape Prices, Page 42

Philadelphia—Release of 15,000 tons by the Pennsylvania railroad on tentative awards three years ago for its electrification project, was a leading development last week in the local structural market. Five companies shared on the distribution. Also of special interest was the placing of 5000 tons for the Choptank river, Cambridge, Md.

New York—Bids are being taken on a 1000-ton viaduct for New Jersey, and quotations close this week on the 12,000-ton Manhattan midtown postoffice. While structural steel fabricators are as yet without a code, the general contractors' code which becomes effective early in March will have an influence on placing fabricated structural steel, forbidding the contractor-buyer to place a subcontract at revised figures without due consideration.

Pittsburgh—Structural contracts are more numerous. Public works projects designed to spread work, however, have been of little benefit to fabricating shops. Low bidders have been announced on the Pennsylvania state letting of Feb. 9. Another letting for Feb. 23 has 630 tons in three bridges. Plain structural shapes continue to be quoted 1.70c, base, Pittsburgh.

Cleveland—Several fair size industrial jobs are being figured, including 600 tons for a mill building and two crane runways for Steel & Tubes Inc., subsidiary of the Republic Steel Corp., at Cleveland. Public construction work still is light.

Chicago — Shape awards were smaller the past week, but new inquiries are accumulating faster than orders. The largest of recent bookings was 1450 tons of piling for the river lock at Guttenberg, Iowa. Bridge work predominates new inquiries, about 10,000 tons being involved in various structures.

Boston—While awards are moderate, pending tonnage approaching the active stage is heavy. The Fore river and Saugus river bridges will take close to 8000 tons.

Buffalo—New inquiry for more than 1500 tons of structural steel is reported here this week. Nearby contracts requiring 700 tons went to outside fabricators during the week.

Contracts Placed

15,000 tons, Pennsylvania railroad for eastern electrification work, distributed to American Bridge Co., Fort Pitt Bridge Works, Pittsburgh; Ingalls Iron Works Co., Birmingham, Ala.; McClintic-Marshall Corp., Bethlehem, Pa.; and Shoemaker Bridge Co., Pottstown, Pa. This is an allocation on tentative contracts placed three years ago.

5000 tons, Choptank river bridge, Cambridge, Md., through Frederick Snare Corp., New York, to McClintic-Marshall Corp., Bethlehem, Pa.; 1700 tons reinforcing bars for this project placed with Kalman Steel Corp., Bethlehem, Pa.

1500 tons, Philadelphia approach to high speed line on the Delaware river bridge, Philadelphia, formally awarded to McClintic-Marshall Corp., Bethlehem, Pa.

1450 tons, piling, lock No. 10, Guttenberg, Iowa, to Bethlehem Steel Co., Bethlehem, Pa.; Hanlin & Oakes, St. Paul, general contractor.

1300 tons, Rosedale viaduct, Kansas City, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

1000 tons, Calvert street bridge, Washington, reported placed through John W. Cowper Co., Washington, general contractor, with McClintic-Marshall Corp., Bethlehem, Pa.; 600 tons of steel bars expected to be awarded shortly.

975 tons, state of Kansas highway bridges, as follows: Sumner county, 160 tons; Montgomery county, 145 tons; Ford county, 450 tons; Osage county, 220 tons, to Kansas City Structural Steel Co., Kansas City, Mo.

700 tons, state of Kansas highway bridges, as follows: Coffee county, 476 tons; Bourbon county, 125 tons; Dickinson county, 100 tons, to St. Joseph Structural Co., St. Joseph, Mo.

600 tons, mill building, Thomasville, Ga., for Goodrich Rubber Co., Akron, O., to Virginia Bridge & Iron Co., Roanoke, Va.

590 tons, lookout towers, department of agriculture, Washington, delivery to various points, to McClintic-Marshall Corp., Bethlehem, Pa.

520 tons, stables and gun sheds, Fort Bragg, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.

440 tons, bridge, Ellis-Kauffman counties, Texas, to Petroleum Iron Works, Beaumont, Tex.; Austin Bros. Bridge Co., Austin, general contractor.

440 tons, bridge, Upatoi creek, quartermaster, Fort Benning, Ga., to McClintic-Marshall Corp.; Hardaway Contracting Co., Columbia, Ga., general contractor.

388 tons, state bridge, Hutchinson county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; R. W. Hable, Corsicana, Tex., general contractor.

355 tons, Stonewall county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; Buckner Bros., Cleburne, Tex., general contractor.

350 tons, highway project, Parker county, Texas, to Houston Structural Steel Co., Houston; Buckner Bros., Cleburne, Tex., general contractors.

345 tons, bridge, James river, Virginia, to Virginia Bridge & Iron Co., Roanoke, Va.

325 tons, bridge, project NRH-132, Suwanee river, Florida, to Vincennes Bridge Co., Vincennes, Ind.

285 tons, bridge, Long Island railroad, Glendale, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

270 tons, signal corps laboratory at Monmouth, N. J., to Belmont Iron Works, Philadelphia; through Walter Kidde Constructors Inc.

255 tons, cylinders, Campostella bridge, Roanoke, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

250 tons, piling, Campostella bridge, Norfolk, Va., to Carnegie Steel Co., Pittsburgh; award of shapes and bars to be announced shortly.

210 tons, Pennsylvania state bridge, Lawrence county, Pennsylvania, to American Bridge Co., Pittsburgh; through Clyde L. Moore, Lowellville, O.

200 tons, piling, navy yard, Norfolk, Va., to Carnegie Steel Co., Pittsburgh.

185 tons, New York Central railroad warehouse, West Thirteenth street, New York, to Harris Structural Steel Co., New York; through Edward J. Duffy Co.

175 tons, conveyor trestle, Rockport, Mich., to Lackawanna Steel Construction Corp., Buffalo.

175 tons, county bridge, Snohomish county, Washington, to Wallace Bridge & Structural Steel Co., Seattle.

175 tons, building for Douglas Aircraft Co., Santa Monica, Calif., to Consolidated Steel Corp., Los Angeles.

170 tons, distillery building, Lexington, Ky., for Pepper Co., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, infirmary, Carrville, La., to Chester Iron & Foundry Co., St. Louis.

145 tons, children's unit buildings at State hospital, Skillman, N. J., to Newton K. Bugbey Co., Trenton, N. J.

140 tons, bridge, Upshur, Franklin and Nueces counties, Texas, to Virginia Bridge & Iron Co., Birmingham.

130 tons, building for Brockton Dairy, Hamden, Conn., to Belmont Iron Works, Philadelphia.

125 tons, shapes and bars, pumping station, Ashburton, Md., to Dietrich Bros., Baltimore; Consolidated Engineering Co., Baltimore, general contractor.

120 tons, shapes and bars, railroad bridge, Prince George county, Maryland, to McClintic-Marshall Corp., and Kalman Steel Corp., Bethlehem, Pa.; Consolidated Engineering Co., Baltimore, general contractor.

113 tons, shapes and bars, addition to Hamilton school, Baltimore, to Maryland Steel Products Co., Baltimore; through Frainie Construction Co.

100 tons, substructure, Fore river bridge, Quincy-Weymouth, Mass. to Boston Bridge Works Inc., Cambridge; V. Barlotta Co., general contractors.

100 tons, highway project, Interboro L Parkway, Queens county, New York, to George A. Just Co., Long Island City, N. Y.; through Rome Construction Co.

Shape Awards Compared

	Tons
Week ended Feb. 17	34,751
Week ended Feb. 10	15,540
Week ended Feb. 3	15,024
This week in 1933	5,185
Weekly average for 1933	15,413
Weekly average 1934	19,464
Weekly average January	17,481
Total to date 1933	76,510
Total to date 1934	135,247

Contracts Pending

5000 tons, radio towers, Panama and the Philippines; bids opened Feb. 14.

5000 tons, superstructure, Fore river bridge Quincy-Weymouth, Mass.

4500 tons, bridge, South Omaha, Nebr.

3000 tons, steel sheet piling, quartermaster depot, Boston; bids in Feb. 14.

1535 tons, bridge, Waynesboro, Va.

1175 tons, bridge, Treichler, Pa.

1173 tons, 9-span deck truss and plate girder bridge, North Whitehall and Lehigh townships, Lehigh and Northampton counties, Pennsylvania; Charles Riebe, Lansford, Pa., low for general contract.

1100 tons, five state highway bridges, Virginia, various locations.

1000 tons, highway bridge, Minnesota.

867 tons, viaduct, carrying route 23, section 13A across Pequannock river with extension of existing bridge, Morris and Passaic counties, New Jersey; bids March 5 at Trenton, N. J.

820 tons, grade separation, Woodward avenue, Detroit, for Michigan state highway department.

750 tons, boiler house, Richmond street, for the Philadelphia Electric Co., Philadelphia; bids opened.

700 tons, bridge for the Pennsylvania railroad over the Anacosta river, near Washington; bids Feb. 23.

650 tons, bridge over Back river, Langley Field, Va.

600 tons, mill building and two crane runways for Steel & Tubes Inc., subsidiary of Republic Steel Corp., at Cleveland; bids being taken.

600 tons, postoffice and courthouse, Binghamton, N. Y.; taking bids.

460 tons, state highway bridge, York county, Pennsylvania; bids Feb. 23.

450 tons, addition, Eastern States Milling Co., Buffalo; bids in.

400 tons, Binghamton, N. Y., postoffice; bids Feb. 27.

300 tons, School 37, Buffalo; bids March 24.

300 tons, approximately, Maryland state bridge over Octoraro creek, near Baltimore.

250 tons, concrete mixing plant, Norris Dam, Coal Creek, Tenn.

250 tons, postoffice, Holyoke, Mass.; taking bids.

200 tons, Reading railroad bridge, Gordon, Pa.; bids asked.

180 tons, two 140-foot truss spans, state bridge, Ross county, Ohio; bids Feb. 23 to state highway commission, Columbus, O.

179 tons, pony truss bridge, Everett borough, Bedford county, Pa.; J. G. King, Altoona, Pa., low on general contract at $43,160; included 24 tons of plain steel bars.

175 tons, steel sheet piling, lock and dam work, Cape Fear river, bids March 2, to United States engineer, Wilmington, N. C.

170 tons, state bridge, Wyoming county, Pennsylvania; bids opened Feb. 23.

150 tons, addition, Auburn, N. Y., prison; bids in.

140 tons, miscellaneous bridge and road work for state; bids Feb. 16 and 17 to state highway commission, Columbus, O.

127 tons, structural steel viaduct, Girard township, Erie county, Pennsylvania; Bates & Rodgers Co., Cleveland, low for general contract.

116 tons, including 93 tons of structurals and 23 tons of plain steel bars, plate girder bridge, Troy township, Bradford county, Pennsylvania; C. F. Goeringer Construction Co., Wilkes Barre, Pa., low on general contract at $35,527.

114 tons, plate girder bridge, Curwensville borough, Clearfield county, Pennsylvania; Minns Bros., DuBois, Pa., low on general contract at $35,227.

100 tons, hangar, coast guard, Salem, Mass.; readvertised.

100 tons, addition, South Park high school, Buffalo; bids this week.

Unstated tonnage, alteration and repairs to state highway bridge, Monongahela City, Pa., over the Monongahela river, also the tracks of the Pennsylvania and Pittsburgh & Lake Erie railroads; repairs estimated to cost $77,036 approved by public service commission.

Tin Plate

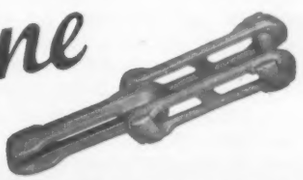
Tin Plate Prices, Page 42

Pittsburgh—At 70 per cent of capacity, the average of tin plate mill operations increased 10 points last week, and this rate promises to continue for at least a month, according to the orders producers have on hand. A leading interest is running over 70 per cent in its tin mill department, and among the independents operating rates range from 50 per cent up to 100 per cent. Tin plate buying has been chiefly from one New York canmaker which entered its 1934 specifications earlier than usual.

New York—Following substantial releases 10 days ago from the leading canmakers, tin plate specifications have fallen off. The market continues at $5.25, Pittsburgh, per base box.

Polish foundries are greatly increasing their exports, especially to Russia, Brazil and the Netherlands.

Use Genuine



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Reinforcing

Reinforcing Bar Prices, Page 43

Chicago—Producers are accumulating fairly large orders for spring shipment. This applies particularly to road work which is deferred during winter months. Illinois has placed 300 tons additional for highway construction, with additional lots to appear for bids later. For the Burlington, Iowa, river lock, 500 tons have been placed. A few private buildings are appearing for bids here, including those of the Campbell Soup Co. and Sears, Roebuck & Co. Bars are steady at 1.95c for cut lengths of billet material, and 1.80c for rail steel.

Philadelphia—Placing of 1700 tons for the Choptank river bridge, Cambridge, Md., and 650 tons for a housing development for hosiery workers in Philadelphia, features the reinforcing bar market. Billet steel bars, in cut lengths, continue at 2.19c, Philadelphia.

New York—Reinforcing bar distributors are now making a $1 a ton delivery charge under a code ruling, the previous charge being 50 cents. Actual business placed has been light, but pending requirements have been gradually upward, New Jersey alone requiring more than 1900 tons for highway and bridge work.

Pittsburgh—Another Pennsylvania state letting for Feb. 23 calls for 218 tons of bars for a Luzerne county bridge. Department of supplies, Pittsburgh, is asking for bids on steel reinforcement bars for the department of public works, bids to close Feb. 19. New billet steel bars hold at 1.90c base, Pittsburgh.

Cleveland—Highway work for which the state highway commission, Columbus, O., is taking bids Feb. 16 and 17 calls for approximately 238 tons of concrete bars. Fabricators estimate about 1000 tons still are pending for projects on which the state recently has taken bids. Private work is lacking.

Boston—Reinforcing steel buying is light, but a fair volume is being figured. Two bridge substructures take close to 1000 tons.

Buffalo—New inquiries for upwards of 1600 tons were noted during the past week, also closing of about 400 tons for two western New York jobs. The outlook for the sale of bars is improving steadily.

Contracts Placed

1700 tons, state bridge, Choptank river, Cambridge, Dorchester county, Maryland, to Kalman Steel Corp., Bethlehem, Pa.; Frederick Snare Corp., New York, general contractor.

650 tons, hosiery workers housing development, Philadelphia, to Taylor-Davis Inc., Philadelphia, and Truscon Steel Co., Youngstown, O.

500 tons, mesh, bridge, Butler county, Pennsylvania, awarded through York Engineering & Construction Co., York, Pa., to American Steel & Wire Co., Pittsburgh.

500 tons, rail steel, Pittsburgh post-office ramps, to Fort Pitt Bridge Works, Pittsburgh.

500 tons, lock No. 18, Burlington, Iowa, to Inland Steel Co., Chicago; Maxon Construction Co., Dayton, O., general contractor.

300 tons, road work in Illinois, to Calumet Steel Co., Chicago.

250 tons, Pennsylvania state bridge, route 175, section 9, awarded through Reibe Contracting Co., Lansford, Pa., to an unnamed seller.

216 tons, widening American river bridge, Sacramento county, California., to unnamed interest.

195 tons, mesh, highway, Schenectady county, New York, to Strope Steel Co., Albany, N. Y.; through M. F. Dollard and M. F. Dollard Jr., Albany.

140 tons, highway, New Brunswick city line to Adams station road, Middlesex county, New Jersey, to Concrete Steel Co., New York; Utility Construction Co., general contractor.

140 tons, culverts, CWA project, in Brook Park, Cleveland, to Truscon Steel Co., Youngstown, O.

115 tons, Fort Lewis, Wash., construction and state bridge in Lewis county, Washington, to unnamed interests.

Contracts Pending

1020 tons, specification NFC 3, by International Boundary commission, for Nogales conduit at Nogales, Ariz.; bids opened at El Paso, Tex., Feb. 12.

1000 tons, addition, Eastern States Milling Co., Buffalo; bids in.

600 tons, School 37, Buffalo; bids March 24.

600 tons, Calvert street bridge, Washington, award expected shortly through John W. Cowper Co., that city.

333 tons, two state bridges in Los Angeles county, Calif.; Clinton Construction Co., Los Angeles, low on general contract.

300 tons, power plant, Pearl Harbor, T. H.; bids Feb. 28.

300 tons, highways, Connecticut; bids in.

289 tons, Pennsylvania state letting for Feb. 23, including the following: 218 tons for Hanover township, Luzerne county; 36 tons for Mashoppen borough, Wyoming county; 24 tons for York, Pa., York county; and 11 tons for North East borough, Erie county, Pa.

223 tons, 9-span truss and plate girder bridge, North Whitehall and Lehigh townships, Lehigh and Northampton counties, Pennsylvania; Charles Riebe, Lansford, Pa., low for general contract.

200 tons, building, Hershey Chocolate Co., Hershey, Pa.; bids asked.

160 tons, mesh, highway, New York state opening of Feb. 16.

155 tons, highway, route 30, section 10, Mercer county, New Jersey; bids March 5, at Trenton, N. J.

144 tons, reservoir, Colton, Calif.; Myers Bros., Los Angeles, low.

138 tons, viaduct, carrying route 23, section 13A across Pequannock river, Morris and Passaic counties, New Jersey; bids March 5 at Trenton, N. J.

114 tons, reinforced concrete and structural steel viaduct, Girard township, Erie county, Pennsylvania; Bates & Rodgers, Cleveland, low on general contract.

Concrete Awards Compared

	Tons
Week ended Feb. 17	5,206
Week ended Feb. 10	2,684
Week ended Feb. 3	2,227
This week in 1933	924
Weekly average for 1933	3,771
Weekly average 1934	4,224
Weekly average, January	4,862
Total to date 1933	25,701
Total to date 1934	29,566

Pig Iron

Pig Iron Prices, Page 52

Pittsburgh—Improvement is lacking, with the market devoid of large inquiries. Though Davison Coke & Iron Co.'s Neville Island stack is the only merchant blast furnace operating at present, Shenango Furnace Co. may blow in one of its Sharpsville, Pa., furnaces before March 1. The prospect is bright that another open-hearth plant in the district may enter the basic market shortly. This mill has been using almost a 100 per cent scrap melt. Effective Feb. 25, basic iron will be priced at $17, Neville Island, a reduction of 50 cents.

Railroad car orders will benefit steel casting plants here in demand for cast underframes and other parts. The market continues $18, Neville Island, for foundry, and $18.50 for bessemer grades of iron, with allowable deductions in effect for river shipments of over 400 tons in the district.

Cleveland—Shipments continue to increase their lead over January tonnage, some lake merchant furnace interests reporting tonnage now 35 per cent ahead of the comparable period last month. Sales are steady, in moderate size lots, few inquiries being issued. While automotive foundries are the most active, requirements for railroad work are expected to pick up shortly. The majority of wheels for the 12,725 freight cars recently awarded by the Van Sweringen lines will be specified for cast iron. Prices are unchanged.

Chicago—Shipments for the first half of February were about one-third heavier than during the corresponding January period. More rapid improvement in deliveries is expected to accompany the current upturn in foundry operations as

stocks accumulated last quarter are being reduced. New business is expanding although inquiries are restricted by the fact that second quarter books do not open until March 1. Indications of price revisions for that period are lacking, the market currently being $17.50, furnace, for No. 2 foundry and malleable.

Boston—Mainly in small lots, but including one 300-ton order, sales in New England during the week totaled close to 1000 tons. Foundry melt has increased slightly in New England. United Shoe Machinery Corp. is reported to have bought 300 tons of Buffalo iron. Inquiry is light.

New York—Sellers look for little immediate improvement in demand from the jobbing foundries, but expect increased specifications to appear later from foundries serving the railroad field. With March 1 approaching, the trade is awaiting with interest definite indications as to what may be expected in the way of second quarter prices.

Philadelphia — While sales so far this year have been light, following the heavy releases in December, car-building requirements are expected to result in an early improvement in pig iron specifications. Trade opinion appears somewhat divided as to the outlook for higher prices for second quarter. Any change will result in some announcement very shortly, it is believed.

Buffalo — With second-quarter books opening shortly, inquiry has increased considerably, especially since rumors of advancing prices in some districts have been heard. February shipments have been increasing slowly and melt, especially in malleable foundries, is much improved. Five furnaces continue in production here.

Cincinnati — Current sales are light, with many foundries still dipping into stocks built up prior to Jan. 1. The district melt is improved.

St. Louis—Buying continues light, although shipments have shown some increase during the last week. The melt in the district is improving in virtually every line, except with the stove interests. Scullin Steel Co. and the Commonwealth division of the General Steel Castings Co., are preparing to light furnaces shortly.

Birmingham, Ala. — Aggregate business, including numerous small tonnage sales, is fairly good although pipe business lags. Production of iron is being held at fairly good average. One or two producers have considerable business on books.

Toronto, Ont.—Merchant sales are holding at the advanced level of the past few weeks. Production is holding at its peak level for the year, with most of the output basic for further use of producing companies. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 44

Pittsburgh—The market on No. 1 heavy melting steel advanced 75 cents a ton last week to $14 to $14.50, based on a tonnage purchase late in the week by a district steel mill at $14.50. Machine shop turnings have been advanced the same amount and other grades display comparable strength, with scrap rails now perhaps stronger than heavy melting steel. Railroad specialties now range between $15.50 and $16. A strong market in the valley has seen as high as $13 paid for No. 2 steel, a price which permits movement of this grade from as far as New England points. A mill in the Pittsburgh district has paid $14.75 for scrap rails.

Cleveland—Prices of steel and iron scrap have been advanced 25 to 50 cents per ton on a number of grades, with offerings small and the situation strong. Supplies are light and producers are holding for better prices.

Chicago—Scrap is marking time, with sales relatively light, but with prices retaining previous gains and in some cases showing further advances. Mills are placing only occasional odd lots of heavy melting steel at $11 but dealers are not interested in booking large tonnages in view of the difficulty in picking up old material. Indications point to higher prices upon the appearance of any substantial demand.

Boston—Scrap is slightly more active. Dealer's buying prices are firmer in several instances, including heavy melting steel, up 25 cents a ton, scrap rails, shafting, machine shop turnings, No. 1 railroad wrought and yard steel.

New York—Buying of heavy melting steel for export continues heavy with additional inquiry from Japan and Italy. With one or two exceptions, Eastern Pennsylvania mills are not taking shipments. The stronger market at Pittsburgh has started some buying in this district for that point.

Philadelphia — With steelmaking operations in this district showing some improvement and with prospects good for further increases over the next several weeks, scrap prices here continue strong. Demand from abroad, England and Japan in particular, continues to contribute to market strength. Some trade interests look for a resumption this week of shipments against contracts at Coatesville, Pa. Recent scattered buying includes about 1500 tons of No. 1 steel for Johnstown, Pa., at $13, delivered, and some scattered tonnage of the same grade at Sparrows Point, Md., at $10.35.

Buffalo—Bethlehem Steel Corp. is reported to have purchased 4000 to 5000 tons of scrap for Lackawanna, paying $12 for No. 1 heavy melting steel and $10.50 for No. 2 steel, hydraulic compressed sheets and No. 1 busheling. Larger dealers are said to be holding off for slightly higher prices.

Detroit—While the iron and steel scrap market continues strong, the increased flow from automobile plants is having a tendency to keep the market on an even keel. The market continues on the basis of $9.50 to $10 for No. 1 heavy melting steel and hydraulic compressed sheets.

Cincinnati—Buying of iron and steel scrap continues in small, scattered lots as mills continue to reduce heavy scrap inventories. Quotations are nominally unchanged.

St. Louis—General Steel Castings Co., Commonwealth division, Granite City, Ill., has bought 5000 tons of scrap, largely No. 1 railroad heavy melting steel, for February and March delivery, pending resumption of production April 1. Offerings are light and prices have advanced 25 cents to $1 per ton.

Birmingham, Ala.—Not much old material is moving. A large consumer of heavy melting steel is buying from time to time. Prices have been readjusted, borings and turnings upwards and others mostly downward.

Toronto, Ont.—Recent improvement in the iron and steel industry is reflected in better demand for scrap. Foundries are taking regular deliveries of cast scrap, and sales of wrought scrap have improved. Stove plate and malleable are spotty. Steel grades are moving slowly, with Canadian mills out of the market. Prices are unchanged.

Coke

Coke Prices, Page 43

No change in the $3.50, Connellsville oven base, on furnace coke has occurred following filing of several revised soft coal prices with the western Pennsylvania code authority for the coal industry recently.

The furnace coke market at Pittsburgh is considerably more active with numerous inquiries from industrial concerns. In addition, a comparably heavy demand is noted for coke for domestic use. Foundry grades at $4.25 for common and $5

for premium hold steady but generally inactive.

Foundry coke shipments at Chicago increased more rapidly during the first half of February, deliveries being about 50 per cent heavier than the month previous, when consumers were using stocks accumulated the prevous quarter. A general although irregular increase in foundry schedules has contributed to heavier shipments. The March market has yet to be announced, current prices being $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

Warehouse

Warehouse Prices, Page 45

Cleveland—Warehouse interests do not anticipate much improvement until mill shipments show further substantial gains. The number of sales is holding fairly steady, but tonnage this month so far is below that booked in the comparable period in January. Prices are firm.

Pittsburgh—The number of individual orders for warehouse steel appears to be increasing but total tonnage is no better than a month ago. Prices are unchanged.

Chicago—Sales are slightly heavier than in January, due principally to gain in demand from outside districts. Prices are unchanged, although some revision in stainless steel products is anticipated.

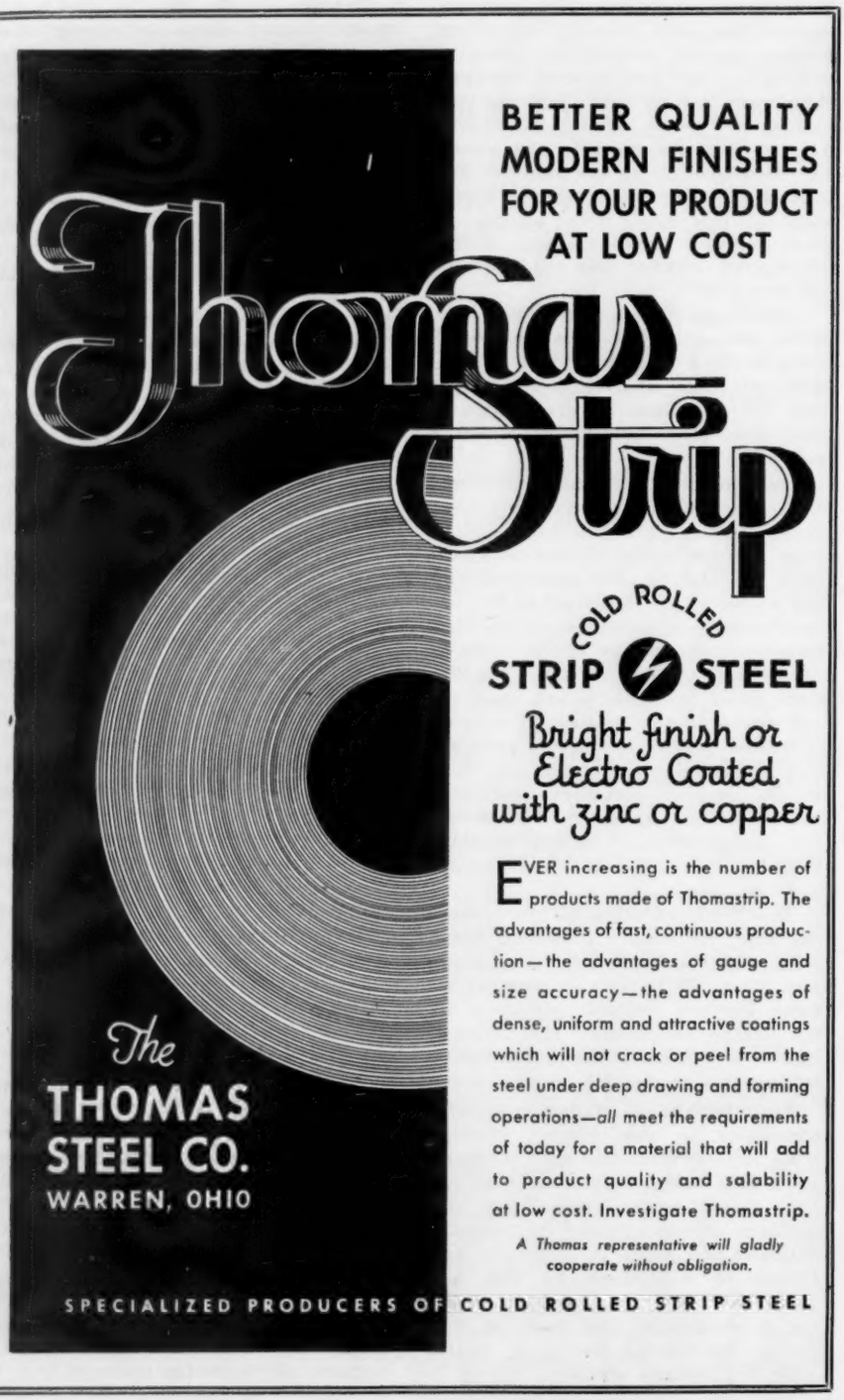
Boston — Boston district warehouses are doing a slightly better volume than those in most sections of New England. Prices are unchanged and buying well spread.

New York — One or two of the larger warehouses are booking a heavier volume than last month despite the fact that building demand is light. This slack is partially made up by a better industrial demand. Prices are firm and unchanged.

Philadelphia—Jobbing demand has lagged a little behind that of the corresponding period last month; however, jobbers believe that volume from now on will be sufficient to bring the daily rate above that for January. Full finished materials appear to be moving better than ordinary grades.

Detroit—Warehouse business in iron and steel is showing a slight increase over the January rate, keeping in step with increased requirements from mills.

Cincinnati—Adjusted for the shorter month, tonnage from warehouse in February will likely be the same as in January, chiefly to meet diversified industrial demand. Prices are unchanged.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Semifinished

Semifinished Prices, Page 43

Semifinished markets last week heard of a possible proposal to advance sheet bars, billets and slabs $1 or $2 a ton, for second quarter. Filing of this price was to be officially determined Feb. 17. Such a move would affect wire rods and presumably skelp, tube rounds and other semifinished steel. Sheet bar demand has picked up at Pittsburgh, where tin plate makers, sheet mills and nonintegrated strip manufacturers have issued heavier specifications.

Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 43

Automotive requirements predominate in bolt and nut demand. Prices

hold at 70 off list for bolts and nuts, 2.75c, Pittsburgh, and 2.85c, Chicago, on large rivets.

Jobbers are buying only fill-in lots at Pittsburgh. Slow structural shape activity, estimated at not more than 18 to 20 per cent currently, has an adverse effect on rivets.

Improvement in demand from jobbers and other consumers in the Chicago district is moderate, with business showing a slight gain over a month ago. While higher prices are anticipated by some for next quarter, no announcements have been made and delay in establishing a code for the industry forestalls setting of more stable quotations.

Nut and bolt sales at Cleveland are 30 per cent ahead of the comparable period last month, with orders from automobile manufacturers leading. Railroads, implement makers, the general manufacturing trade, and southern jobbers also have contributed to the improvement.

Metals

Nonferrous Metal Prices, Page 43, 44

New York—Demand for nonferrous metals was generally quiet with buying of lead outstanding. Little fluctuation was apparent in prices, including tin.

Copper—The United States Copper association presented a revised code to the National Recovery administration which will come up for hearing Feb. 27. The code principally involves labor provisions. Price control, production and sales quotas are left to voluntary agreement. The market was extremely quiet last week with total sales amounting to only a few hundred tons. First hand copper could be had at no less than 8.00c, Connecticut, but resale metal was offered as low as 7.75c. Stocks in North and South America increased 5500 tons in January.

Lead—Fair purchasing of lead was reported early in the period, mostly for March shipment. Prices remained on the basis of 3.90c, East St. Louis, and 4.00c, New York.

Zinc—A strong ore market in the Tri-State continued to lend support to the refined metal with the prevailing level 4.40c, East St. Louis, for delivery through March.

Tin—No sharp fluctuations in prices developed although a slight strengthening in sterling exchange late in the week pushed Straits up to the 52-cent level.

Antimony—Demand still was dull and prices unchanged.

Silver—The official price went to a new high of 46.00c on reports that governmental measures will be taken to aid the metal.

Equipment

Pittsburgh—A prominent steel bar mill at Pittsburgh is preparing to install a mill for making precision round hot-rolled bars capable of finishing to plus or minus 0.005-inch. This will supplement existing capacity by three independent Ohio mills on this type of bar mill. Installation of several wide sheet mills still is being discussed but none has been contracted for yet. Several mills in the Pittsburgh district have been buying ahead on ingot mold requirements, this type of speculative purchasing of molds having become apparent in the market last week. Plant expansion of an undisclosed nature is being planned by an interest near Weirton, W. Va., where according to present plans a large steel fabricating plant will be built.

Chicago—Youngstown Sheet & Tube Co. will start work shortly on the installation of a Steckel mill at its Indiana Harbor, Ind., plant. This equipment will be used in connection with a cold strip mill, recently installed, for the production of tin plate. Equipment markets generally remain fairly active, orders being more numerous and larger than a year ago. Few machine tool orders are appearing from railroads. Federal projects are accounting for a fair volume of business in machinery and miscellaneous equipment.

Iron Ore

Iron Ore Prices, Page 52

New York—Three cargoes of North African iron ore are expected to arrive on the eastern seaboard for the account of an eastern consumer before April 1.

Quicksilver

New York—Quicksilver prices are stronger at $72 to $73, a virgin flask of 76 pounds in small lots, and $72 a flask in round lots.

Ferroalloys

Ferroalloy Prices, Page 52

While specifications for ferromanganese and domestic spiegeleisen exceeded those for the corresponding period of last month, they have slowed up slightly in the past few days. This trend is expected to be only temporary. Ferromanganese is steady at $85, eastern seaboard, on first quarter shipments; and spot domestic spiegeleisen, 19 to 21 per cent, $26, furnace.

Production

(Concluded from Page 13)

provement being largely in anticipation of releases from the railroads and railroad equipment companies.

Pittsburgh—Owing to an increase in ingot schedules of a leading producer, district steel operations advanced 5 points last week to 26 per cent. Increase in open-hearth schedules is due mainly to demand for sheet bars. Further gains here are dependent upon release of railroad business which, when forthcoming, should improve Pittsburgh operations to well over 35 per cent.

There still are 17 out of 60 steelworks blast furnaces on in this district, individual rates being as follows: Carnegie Steel Co. 9 of 32; Jones & Laughlin 3 of 11; Bethlehem at Johnstown, Pa., 2 of 7; and Pittsburgh Crucible, National Tube, and American Steel & Wire Co. one each.

Buffalo: Up 6½ points last week to 42½ per cent, and expected to maintain the rate this week. Sixteen open hearths are scheduled.

Birmingham: Unchanged at 52 per cent and likely to maintain this rate so long as the Ensley Works of the Tennessee Coal, Iron & Railroad Co. continues in operation.

Detroit: Unchanged at 79 per cent, with 12 out of 18 open hearths on.

Wheeling—With 27 of 39 open hearths on in four district plants, steel ingot operations held unchange at 69 per cent.

New England—Steel ingot operations held at 82 per cent last week, the expected drop not materializing. For this week the rate will probably be held. Two steel works are operating 90 per cent each. Only three furnaces are down.

¶General Steel Castings Corp., Eddystone, Pa., will reopen its Commonwealth division at Granite City, Ill., April 1, returning about 1000 men.

¶When shipments of finished steel of the United States Steel Corp. declined in January to 331,777 tons, from 600,639 tons in December, they went against the seasonal trend, but fulfilled the expectation that January would be a slow month on account of the bulge in December to clean up fourth quarter contracts.

Pacific Coast

Pacific Coast Prices, Page 43, 44, 45

San Francisco—(*By Air Mail*)—Demand for steel products was not heavy the past week and awards aggregated less than 2500 tons.

The reinforcing bar market was the most active, more than 1200 tons being booked. The largest letting involved 350 tons for a brewery in San Diego, Calif. Inland Steel Co., took 215 tons for Boulder dam and unnamed interests secured 216 tons for a bridge extension over the American river near Sacramento, Calif. Bids have been opened on 1020 tons for the Nogales conduit at Nogales, Ariz., and on 333 tons for two bridges in Los Angeles county, California.

No plate bookings of size were reported. Oakland, Calif., opened bids Feb. 14 for 208 tons for a 16-inch welded steel pipe line. Escondido Mutual Water Co., Escondido, Calif., has taken bids on 160 tons for a 24-inch welded steel pipe line. Western Pipe & Steel Co. is low bidder on 100 tons for dump bodies for the garbage department, Sacramento, Calif.

Structural shape lettings totaled less than 1000 tons. Consolidated Steel Corp., took 175 tons for a building at Santa Monica, Calif., for Douglas Aircraft Co. Bids open Feb. 28 for 2500 tons for a power plant at Pearl Harbor, T. H. In addition, 300 tons of reinforcing bars are involved.

Cast iron pipe awards were confined to lots of less than 100 tons. Fresno, Calif., opened bids on 364 tons of 8 to 12-inch pipe. Morgan Hill, Calif., will take bids March 1 for 456 tons of 4 to 8-inch pipe and Oakland, Calif., opened bids on 628 tons of 16-inch pipe Feb. 14. Movement of standard steel pipe is slow.

Prospects Grow Better

Seattle—Prospects for iron and steel are improving in the Pacific Northwest although several important projects are being held back by plan revisions or delays due to governmental regulations. The largest private project under way is the grain elevator under construction at Vancouver, Wash.

The week's awards include 175 tons of shapes to Wallace Bridge & Structural Steel Co., Seattle, for a span over Stillaguamish river, Snohomish county, Wash., and 115 tons of reinforcing to unnamed interests for a state bridge in Lewis county and Fort Lewis construction.

Additional awards are pending for the Seattle seawall project while no action has been taken on 2300 tons of reinforcing for the Ambursen sidedam, Bonneville development. Plans are in preparation for the Columbia river bridge at Coulee dam, bids in about two weeks.

Bids for a bridge in Skagit county, Washington, involving 300 tons of shapes and concrete bars, set for Feb. 16, have been postponed, due to revision of plans. Steel mills and fabricating plants have booked a few tonnages in less than 100-ton lots.

Washington awarded five road jobs this week totaling $215,000 but not requiring nc steel. Bids due Feb. 27 include five road jobs and two bridges at Colfax, Wash., 113 and 108 feet in length respectively. Bureau of Roads at Portland will receive tenders Feb. 21 for three small bridges in Wallowa National forest, Oregon, involving 52 tons of shapes and reinforcing. Idaho has awarded a small bridge job to J. M. Sharp, Boise, Idaho, at $10,235 and opens bids Feb. 20 for a concrete bridge over Paradise creek.

McClintic-Marshall Corp., Bethlehem, Pa., is reported to have been awarded at $19,420 the contract for eight spud wells and frames for four dredges for the Fort Peck, Mont., project.

The wholesale jobbing trade reports small turnover, orders confined to immediate requirements. Prices are firm.

Substantial shipments of scrap are going to Japan, mainly under old contracts. Supplies in this area are nearly exhausted and higher prices are awaited before dealers will accumulate stocks. No. I relaying rails have been sold here at $12.25, f.a.s., scrap rails are quoted at $10 and No. 1 box-size scrap at $8.50. The market is firm and additional business from Japan is expected shortly. Dulien Steel Products Co. has purchased locally 3000 tons of 50 to 75-pound scrap logging rails which are being shipped to Dairen, Manchuria, for mine props. Domestic demand is nominal.

Steel in Europe

Foreign Steel Prices, Page 45

London—(*By Cable*)—A sharp increase in output of pig iron and steel ingots was made in January. Production of pig iron was 441,300 gross tons, compared with 409,300 tons in December, a gain of 32,000 tons, 7.8 per cent. Ingot production was 711,000 tons, compared with 668,900 tons in December, an increase of 42,100 tons, over 6 per cent.

Middlesbrough pig iron output has been sold for six months into the future. Domestic foundry hematite has been advanced 5s per ton. In the Midlands the steel trade is quieter, with sheet demand particularly dull. The Scottish home market is fairly active. Steel bars have been advanced to £8 12s, following an agreement between rerollers and steelmakers. Tin plate mills are operating at 50 per cent with the outlook improving, South America, Scandinavia and Canada buying.

The Continent reports export trade quiet and prices firm.

Men of Industry

(*Continued from Page* 19)

Pacific Coast subsidiary of the Cyclone Fence Co.

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Edmund W. Miller, for two years assistant manager of the Indianapolis branch of Crane Co., has been named manager of this branch, succeeding Robert A. MacGill.

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H. S. Schroeder has been named Chicago district sales manager for the La Salle Steel Co., Palmolive building, Chicago. Formerly he was western manager at Chicago for Republic Steel Corp.

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Seeley Pratt has been re-elected president of the Union Steel Chest Corp., LeRoy, N. Y. Others relected are: Vice president, Orrin J. Mitchell; and secretary and treasurer, Gilman C. Perkins.

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A. G. Pratt, president, Babcock & Wilcox Co., New York, has been elected to the board of directors of Worthington Pump & Machinery Corp., Harrison, N. J. He is also a director in a number of other companies, including Diescher Tube Mills Inc.

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H. A. Brassert, president, H. A. Brassert & Co., Chicago, has returned from London where the English affiliate of the Brassert company has undertaken contract for construction and operation of a new steel plant at Corby, Northamptonshire, for Stewart & Lloyds Ltd.

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J. H. Van Sciver has been re-elected president of the Bethlehem Foundry & Machine Co., Bethlehem, Pa. The following were similarly reappointed: Vice president and general manager, Eugene C. Clarke; treasurer, G. Ernest Finck; and secretary, Miss Iva Krause.

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C. V. Murray has been appointed to the New York staff of the Patterson Foundry & Machine Co., East Liver-

pool, O. He has covered the New York territory for the past 13 years as sales engineer of the Robinson Mfg. Co., Muncy, Pa. His new headquarters will be at 30 Church street.

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William G. Mather and E. B. Greene have been re-elected directors of the McKinney Steel Holding Co., owner of controlling interest in the Corrigan, McKinney Steel Co., Cleveland.

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R. P. Hutchison recently was re-elected president and general manager of Bethlehem Fabricators Inc., Bethlehem, Pa. Others similarly chosen were: First vice president, W. S. Hutchison; second vice president and general counsel, R. S. Taylor Sr.; and secretary-treasurer, Ivan M. Gangewer.

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William J. Wolf, of Wolf & Co., Hamilton, O., has been elected president of the Cincinnati chapter of the Institute of Scrap Iron and Steel. Other officers elected include: Vice president, Harry Goldberg, Goldberg Iron & Steel Co., Columbus, O.; secretary-treasurer, B. Hirshorn, Wolf & Co.

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P. J. Freeman, a Pittsburgh consulting engineer and in 1924 chief engineer for the Allegheny county bureau of specifications and tests, has been retained by the Tennessee Valley Authority to organize a department of specifications and tests.

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J. Verner Scaife Jr., connected with the Wm. B. Scaife & Sons Co., Pittsburgh, since his graduation from Yale university in 1927, and for the past several years vice president, has been elected president. He succeeds his brother, Alan M. Scaife, who will continue in the capacity of vice president, but who as noted in STEEL for Feb. 5 recently was elected chairman of the board of Pittsburgh Coal Co.

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Walter I. Bregman, Price Iron & Steel Co., Chicago, has been elected president of the Chicago chapter of the Institute of Scrap Iron and Steel. Other officers elected include: First vice president, John T. McEnroe, John T. McEnroe Co.; second vice president, Isadore Cohen, Cohen Iron & Metal Co., Milwaukee; third vice president, R. C. Heun, Ohio Metal Supply Co.; treasurer, Arthur L. Jeffery; secretary, H. M. Rosenthal, Briggs & Turivas.

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J. A. Doucett, formerly vice president and general sales manager of Revere Copper & Brass Inc., New York, has been appointed vice president in charge of sales. In his new capacity he will give special attention to matters pertaining to the NRA code for the copper and brass mill products industry.

C. A. Macfie, formerly assistant sales manager, becomes general sales manager. He has been with the Revere company for five years.

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John Duffy has been appointed superintendent of the foundry department, Federal Mogul Corp., Detroit. Receiving his education and early training in England, he came to this country after the war and was first associated with the E. W. Bliss Co., Brooklyn, N. Y. Other previous foundry connections include the Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; Fairbanks Co., Binghamton, N. Y.; Worthington Pump & Machinery Corp., Harrison, N. J.; Troy Sunshade Co., Troy, O.; and American Metal Products Co., Milwaukee.

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Louis E. Murphy has been re-elected president of the E. F. Houghton & Co., Philadelphia, manufacturer of oils and mechanical leather goods. Other officers named at the annual meeting of the company are: First vice president and general manager, Maj. Aaron E. Carpenter; second vice president and director of sales, George W. Pressell; secretary, A. E. Carpenter III; and treasurer, Dr. R. H. Patch. Board of directors for the coming year will include the above officers and H. B. Fox, purchasing agent.

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INDUSTRIAL BROWNHOIST

Here and There In Industry

E. D. CLAPP MFG. CO., Auburn, N. Y., manufacturer of drop forgings, is celebrating its seventieth anniversary. It was founded in 1864 by E. D. Clapp, grandfather of the present head of the company, as E. D. Clapp & Co. and was incorporated in 1876 as E. D. Clapp Mfg. Co. E. D. Clapp was president and his son, Delemar E. Clapp was treasurer. On the death of the former in 1889 the latter became president and served 40 years until his death in 1929. At that time E. D. Clapp, his son, became president, after having been treasurer since 1909. Present officers are: President, E. D. Clapp; vice president, H. W. Clapp; assistant treasurer, E. A. Clapp; secretary, R. G. Brockway; assistant secretary, W. R. Steele. The company's production includes drop forgings for motor cars, trucks, tractors and other purposes and also machines, heat treats and assembles.

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Pratt & Letchworth Co., Buffalo, has resumed operations in its malleable department after a shutdown of several months.

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Allegheny Steel Co., Brackenridge, Pa., has appointed Otto Kafka Inc., 2 Rector street, New York, export sales agent for its products.

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Ingersoll-Rand Co., 11 Broadway, N. Y., has acquired the turbo-blower business of General Electric Co. and will consolidate it with its own turbo-blower department at Phillipsburg, N. J.

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Scullin Steel Co., St. Louis, has reopened on part schedule after being closed since November. Orders in hand are sufficient for 40 to 50 per cent, operation for several months.

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Lockwood Greene Engineers Inc., New York, has moved its executive office from 100 East Forty-second street to 30 Rockefeller plaza and its Boston office from 4 Federal street to 40 Central street.

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Jeffrey Mfg. Co., Columbus, O., has opened offices in the Carew Tower building, Cincinnati, and the Rockefeller building, Cleveland. Lyle Martin is in charge of the Cincinnati office and G. D. Francisco and J. R. Warren in the Cleveland district.

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Air Reduction Co. Inc., New York, exercised its option Jan. 1 on the remainder of the capital stock of the Wilson Welder & Metals Co., North Bergen, N. J., and becomes full owner. The company believes this is the first instance of an oxyacetylene welding organization wholly owning an electric welding company.

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Eaton Mfg. Co., Cleveland, manufacturer of automotive materials, has purchased the bumper plant of the Alloy Spring & Bumper Co., Jackson, Mich., from the receiver. The plant has been occupied by the Eaton company on lease for several months. The buildings contain 102,000 square feet of floor space on a site of 32 acres.

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Carpenter Steel Co., Reading, Pa., has moved its New York sales office and welded alloy tube division to Equitable Trust building, 347 Madison avenue. Sales of tool, alloy and stainless steels will be in charge of W. O. Steele and N. C. Einwechter and welded tubes in charge of E. W. Bachman and A. K. Smalley.

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General Electric Co., Schenectady, N. Y., has started production of gas-burning furnaces in a plant it has equipped in the buildings formerly occupied by the B-Line Boiler Co., Taft avenue and East 131st street. The gas furnace is designed to supplement the oil furnace already in the General Electric line. J. M. Fitzwilliam, formerly president of the B-Line company, is in charge of manufacturing.

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Whitehead Stamping Co. is the new name for the Kales Stamping Co., Detroit, according to current announcement by officers. Kales Stamping Co. was organized in 1904, a pioneer maker of metal stampings and pressed metal parts. Change in name does not affect personnel or policy. J. Frazer Whitehead is president, Thomas C. Whitehead vice president and George W. Schreck secretary.

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Electric Auto-Lite Co., Toledo, O., has purchased the Moto-Meter Gauge & Equipment Co., also of Toledo, approval being voted by stockholders of both. The consolidated company is to be named Auto-Lite Moto-Meter Corp. C. O. Miniger, president of Auto-Lite, will be president and R. G. Martin, former president of Moto-Meter, and D. H. Kelly will be vice presidents. Toledo plants of the two companies are to be consolidated but other plants will not be changed.

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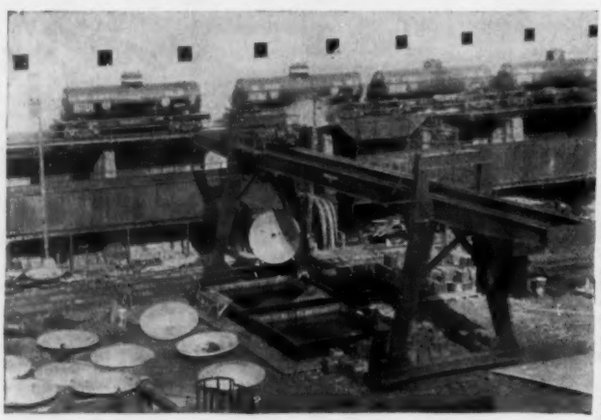
Westfield Mfg. Co., Westfield, Mass., has been organized as a subsidiary of the Torrington Co., Torrington, Conn., and has bought all the assets of the old Westfield Mfg. Co. The latter was a pioneer manufacturer of bicycles and the new company will continue production in the plant at Westfield. Officers of the new company are: President, E. H. Broadwell; vice president, N. R. Clarke; treasurer, George R. deLearie. Mr. Broadwell has been receiver for the company and formerly was a vice president of the Fisk Rubber Co. Mr. Clarke has been with the old company since its foundation and has been in charge of operation during the receivership. Mr. deLearie formerly was assistant treasurer of the Fisk Rubber Co. and has handled finances of the receivership. Sales will continue in charge of C. J. Fogarty, with L. D. Harden as assistant, and purchasing in charge of John E. Lyons.

Woolford Wood Tanks



Three Woolford Tanks, each 16 feet square used for No. 1 pickle finish on stainless iron or steel.

FOR ALL PICKLING OPERATIONS

Woolford Wood Tanks are furnished in dense grain, untapped, yellow pine. Extruded, lead covered rods as well as anti-acid rods are furnished where necessary.

Wood and steel tanks are also built to any specifications.

Complete information furnished upon request.

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Construction and Enterprise

New England

HAMDEN, CONN.—Brock Hall Dairy Corp., 1204 Whitney avenue, is having plans revised by A. Vroman, and Jacob Field, 104 Park avenue, New York, on a two-story mill plant and equipment, to cost $175,000. Contract will be awarded in three to four weeks to a selected list of bidders.

BRIDGEWATER, MASS. — Town school commission is having plans made by Towner & Sellew Associates, 329 Main street, Middletown, Mass., for a two-story addition to Bedford High school to cost $50,000, and a two-story elementary junior high school in East Bridgewater, Mass., to cost $150,000.

New York

BATH, N. Y.—An appropriation of $60,000 has been provided for an enlargement of the heating plant and other mechanical improvements at the Soldiers Home here.

BUFFALO—Fedders Mfg. Co. will add the manufacture of steel beer kegs to its line of products.

FRENCH CREEK, N. Y.—Town board plans laying water mains and installing pumping machinery and equipment. E. Storer, town clerk.

GENEVA, N. Y.—Plans are being drawn for a $60,000 addition to the Ontario county hospital at Hopewell, near here.

INTERLAKEN, N. Y.—Village plans constructing water works system. A $60,000 loan and grant has been allotted by PWA.

LOCKPORT, N. Y.—L. A. Harding, Prudential building, Buffalo, has been engaged to prepare plans for a municipally owned hydroelectric plant.

LONG ISLAND CITY, N. Y.—Corporation, care I. Rosenthal, 2404 Avenue O, Brooklyn, N. Y., will receive bids in March or later, on general or separate contracts for group storage tanks and bulk plant at Metropolitan avenue and Long Island railroad. The estimated cost is $150,000.

NEW YORK—J. D. Black, Jobstown, N. J., has plans by S. W. Katz, 527 Fifth avenue, New York, for altering storage and boiler room at 119 East Twenty-third street. The cost will be $28,000 with equipment.

NEW YORK—Everbrite Corp., 584 Broadway, is having plans made by W. I. Hohauser, 17 West Forty-fourth street, for alteration of its plant, storage and boiler room, 36 Orchard street. The cost will be $28,000, with equipment.

SYRACUSE, N. Y.—Atlantic Refining Co., has taken bids for construction of seven tanks to hold 5,500,000 gallons of gasoline and oil, at a cost of more than $400,000, the tanks to be erected on a site on Solar street, Syracuse.

New Jersey

TENAFLY, N. J.—Rockland Distillery Co. is planning to build a distillery, to cost $35,000 or more.

WESTFIELD, N. J.—Board of education has had plans by Coffin & Coffin, 522 Fifth avenue, New York, for a school to cost $275,000, for which bonds have been voted and PWA loan approved.

Pennsylvania

BELLEVUE, PA.—Bids will be received by the board of school directors at the office of the superintendent Feb. 26, for the installation of two underfeed automatic stokers at Bellevue high school. Owner, School district of Borough of Bellevue, H. J. Freese, secretary.

BUTLER, PA.—Plant equipment of the Steel Car Forge Co., Ellwood City, Pa., is being moved to the plant of the Standard Steel Car Co., Butler, Pa. It is expected the Steel Car Forge Co. plant will be offered for sale. The latter company has had capacity for making freight car and other railroad forgings. Both companies are subsidiaries of the Pullman Co., Chicago.

GLENSHAW, PA.—Thomas Spacing Machine Co. has received orders for machinery to be installed on three dams in the Mississippi river, the orders being valued at about $100,000.

PITTSBURGH—Rust Engineering Co., Koppers building, will build additions to the Wright Field, O., heating plant for the government, a $204,900 contract having been awarded by the war department to them Feb. 8.

PITTSBURGH—James Criswell Co., Pittsburgh, has received contract from the Dominion Foundries & Steel Ltd., Hamilton Ont., Can., for one 4-hole soaking pit of a regenerative type to be equipped with Isley furnace control apparatus.

Ohio

CLEVELAND—Steel & Tubes Inc., subsidiary of Republic Steel Corp., Youngstown, O., is buying 600 tons of structural steel for an addition to its plant here to house new boiler tube mill, to cost $350,000. Plant is at 224 East 131st street, Cleveland.

FOSTORIA, O.—Great Northern Distilleries Inc., care Don C. Hanover, Fostoria, O., plans a 1-story powerhouse at its new distillery, with electrical power equipment, to cost about $400,000. Claude H. Stone, Fostoria, O., is vice president and general manager.

NEWCOMERSTOWN, O.—Plant of the Kilgore Metal Products Co., here, owned by the Home Improvement Co., has been leased to R. E. Matticks, Newark, O., and E. A. Peak, Westerville, O., who will manufacture iron toys, toy pistols and similar products.

YOUNGSTOWN, O. — Youngstown Sheet & Tube Co. has authorized construction of a 42-inch Steckel hot-strip mill at its works at Indian Harbor, Ind.,

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Michigan

BENTON HARBOR, MICH.—Barrien County Brewing Co. is remodeling a furniture factory building into a brewery at cost of $20,000.

BENTON HARBOR, MICH.—Joel Pearson, contractor, is taking bids on subcontracts for the $90,000 remodeling and modernizing program of the Benton Harbor Brewing Co. M. F. Strauch, Chicago, architect.

DEARBORN, MICH.—H. E. Walker Distillers & Brewers Inc., Detroit, plans to erect a distillery at Dearborn, Mich.

DETROIT—Bee Smelting & Refining Co., 2921 East Davison avenue, has been organized to deal in metals. Correspondent: Manuel H. Hendelman, 14350 Harper avenue, Detroit.

DETROIT—Mildner & Eisen, 924 Hamm building, architects, have completed plans for an $80,000 brewery in North Lansing for the Lansing Brewery Co. It involves remodeling of existing structures.

DOUGLAS, MICH.—Real Joy Toy Mfg. Co., Saugatuck, Mich., has moved its machinery equipment to the plant of the Devine Supply & Lumber Co., at Douglas, where with additional machinery, all kinds of mill work may be done under supervision of Erland Sundin.

GRAND RAPIDS, MICH.—Grand Rapids Brewing Co. is having plans made by Mildner & Eisen, 924 Hamm building, Detroit, for remodeling former plant of H. M. Reynolds Shingle Co. into a brewery with capacity of 150,000 barrels. G. A. Kusterer is president.

HIGHLAND PARK, MICH.—Center Lock Drill Bushing Co., 12125 Cardoni, has been organized to manufacture drill bushings. Correspondent: Lee P. Rabaut, 19240 Burlington drive.

HOUGHTON, MICH. — A. Haas Brewing Co. has increased capital from $100,000 to $175,000 to enlarge plant, including 15 new tanks of 125 barrels capacity.

Indiana

AUSTIN, IND.—American Can Co., New York, is planning to erect a factory, 200 x 300 feet, at Austin. It is estimated that nearly 200 persons will be employed when the plant is in operation. Austin was selected because of the large number of packing plants in that section of the state, although it is said the entire output will not be devoted to the packing industry.

Illinois

CHICAGO—Insulated Container Corp., 22 West Monroe street, room 1100, has been incorporated to manufacture cartons and carton machinery by Edward W. Stoddard, 1038 Balmoral avenue.

CHICAGO—General Parts Mfg. Co., 2120 South Wabash avenue, has been incorporated by Joseph J. Gray, Nathan Dewoskin and Rose Dewoskin, to manufacture and distribute automotive parts and accessories and related lines. Correspondent: Nathan Dewoskin, 2120 South Wabash avenue, Chicago.

CHICAGO — Hinton Engineering Corp., 3605 North Claremont avenue, has been incorporated with 1000 shares of no par value common stock by L. E. Hinton, J. F. Gaul and Frank Brady, to deal in stokers, conveyors, smoke eliminators, etc. Correspondent: Coyes and Klingler, 35 East Wacker drive.

CHICAGO—Knisley Sheet Metal Co. Inc., 555 West Monroe street, has been incorporated by Walter H. Eckert, George W. Dreher and J. Raymond Tottenhoff, to deal in building supplies and materials. Correspondent: Eckert and Peterson, 10 South LaSalle street.

GIRARD, ILL.—City has been allotted a PWA loan of $109,000 for a four mile, 8-inch line from Virden, Ill., connecting with feeder line from Springfield, 6-inch distribution mains, hydrants, valves, pumps, tank on tower. Caldwell Engineering Co., Jacksonville, Ill., is engineer. Bids will be received about March 1.

VIRDEN, ILL.—City will receive bids about March 1 for water distribution system, including force main to connect with feeder trunk line from Springfield water system, local distribution mains, fire hydrants, valves, pumps, tank on tower, etc. A loan of $188,000 has been alloted by PWA. Caldwell Engineering Co., Jacksonville, is engineer.

Southern

TOWN CREEK, ALA.—Lawrence county board of education, Earl M. Hodson, superintendent, Moulton, Ala., is planning to build a 90 x 75-foot, one-story building. State department of education, Montgomery, Ala., is architect.

LOUISVILLE, KY.—Merhoff-Balmer Iron Works has been incorporated with $10,000 capital by J. H. Marhoff and William H. Balmer.

WINSTON-SALEM, N. C.—Winston Lead Smelting Co. has been incorporated by G. W. Douglas, 1724 Virginia road, and T. S. Douglas Jr.

HARTSVILLE, S. C.—W. A. Ebert, Charlotte, N. C., has been awarded contract by the city of Hartsville for improvements to waterworks and sewer system. Ryan Engineering Co., 41 Arcade building, Columbia, S. C., is consulting engineer.

RICHMOND, VA.—DuPont Rayon Co., 350 Fifth avenue, New York, is planning to spend $5,000,000 for new unit. Construction work will start as soon as plans are completed. Willis Shackelford is plant manager.

DANVILLE, VA.—Election will be held Feb. 20 on $3,000,000 bonds to finance expansion of city electric plant.

INDEPENDENCE, VA.—Towns of Marion and Galax are planning the construction of a hydroelectric plant on New river, near here.

ROANOKE, VA.—Virginia Bridge & Iron Co., Roanoke, Va., has contract from government for 975 tons of steel for lock and dam work on Cumberland river.

CHARLESTON, W. VA.—Federal Power commission has authorized Kanawha Valley Power Co., W. H. Wheelwright, 1632 Virginia avenue, Charleston, W. Va., to generate electricity at two points on upper river at New London and Marmet dams. Work on the two $2,500,000 power plants is to begin shortly.

PHILIPPI, W. VA.—Barbour county board of education is planning a $400,000 program for construction of high schools at Philippi and Belington, W. Va.

Missouri

MOBERLY, MO.—Missouri Culvert & Pipe Co. has been incorporated with $40,000 by John W. Jones Jr., Morberly, and Edward H. Weyman, Middletown, O.

Arkansas

VANBUREN, ARK.—The one-story school proposed by the VanBuren board of education will include steel sash and trim, structural steel, and ventilators. Estimated cost is $50,000. Bassham & Wheeler, Fort Smith, Ark., are architects.

Oklahoma

CUSHING, OKLA. — Oklahoma Western Gas Co., R. M. Tuttle, president, is planning construction of steel pipe line for natural gas trunk and distributing service at an estimated cost of $1,474,325. Ford, Bacon & Davis Construction Corp., First National Bank building, Dallas, Tex., and 53 Broadway, New York, is engineer.

Texas

AUSTIN, TEX.—Bullum Inc. has been incorporated with $10,000 capital by A. D. Gaston, O. E. Eckhoff and Steve Bullum, all of Austin, Tex., to manufacture metal products.

CALDWELL, TEX.—Bids will be received in about 30 days by the city for waterworks improvements. R. Dady, Provident building, Waco, Tex., is engineer.

COOPER, TEX.—City is planning a $30,000 waterworks and sewer system. W. F. Hicks, Paris, Tex., is engineer.

HOUSTON, TEX.—American Brewing Co. is planning to build a brewery,

with annual capacity of 120,000 barrels, at Second, Girard and Railroad streets.

PECOS, TEX.—Red Bluff Water Power Control District has $2,600,000 loan from government for construction of large storage dam, hydroelectric plant, etc. Vernon L. Sullivan, district engineer.

SAN ANTONIO, TEX.—Board of education, R. S. Menofee, president, is planning to build a $200,000 North Side junior high school, which will include cafeteria, kitchen and shops, and also a South Side senior high school, to include cafeteria, at a cost of $750,000. Phelps & Dewees, Gunter building, are school architects.

TROUP, TEX.—Sinclair-Prairie Oil Co., Sinclair building, Tulsa, Okla., contemplates erection of a natural gasoline plant in Greeg Co., East Texas oil field. Tentative plans call for a plant of approximately 40,000 gallons daily capacity, which will require 15 engine compressor units.

Wisconsin

MADISON, WIS. — Tinius Olsen Testing Machine Co., 500 North-Twelfth street, Philadelphia, is low bidder for furnishing the federal forest products laboratory here with one new 25,000-pound testing machine at $3745, and for repairing seven existing machines at $46.

MILWAUKEE — Postmaster Peter F. Piaseeki has peen notified by the treasury department that $46,000 has been alloted for installing new electric elevators to replace pneumatic lifts in the postoffice and federal court building.

MILWAUKEE—The mayor has been authorized by city council to apply for a federal loan and grant of $14,820,000 to finance a municipal electric generating plant and distribution system. R. E. Stoelting is commissioner of public works.

MILWAUKEE — The municipal sewerage commission has accepted bid of Hoffman Combustion Engineering Co., 310 South Michigan avenue, Chicago, to replace an automatic stoker for an 800-horsepower boiler in the disposal plant at $14,408, and option on three additional replacement units at $43,224.

RACINE, WIS.—The city council has ordered a special election for March 13 on acceptance or rejection of federal grants and loans of $850,000 for a sewage disposal plant, and $300,000 for a storm sewer system.

TWO RIVERS, WIS.—The city council has reconsidered its action on the proposed $240,000 municipal power plant project and ordered reinstatement of application for loan and grant to PWA.

Dominion of Canada

OTTAWA, ONT.—Bids will be received Feb. 22 by secretary of the board of control, for the manufacture, supply and installation of hydraulic turbine-driven centrifugal pumping equipment in Queen street pumping station. The estimated cost is $20,000. W. E. Macdonald, city hall, is engineer.

INGERSOLL, ONT.—Ingersoll Machine Co. has started production of Gemmer steering gears for automobiles. About 85 machines are in operation and plans are being made to enlarge the plant.

New Trade Publications

PYROMETERS—Brown Instrument Co., Wayne and Roberts avenues, Philadelphia, has published a bulletin on its potentiometer pyrometer. A catalog also discusses the same subject more in detail.

BRONZE AND SILVER—Riverside Metal Co., Riverside, N. J., has issued a folder on free-cutting phosphor bronze and nickel silver, listing characteristics of the metals and outlining the diversity of their application.

STAINLESS STEEL—A booklet on what good stainless steel is supposed to do has been issued by the American Rolling Mill Co., Middletown, O. It explains the uses of this material in a wide variety of applications.

MOTOR BASES—Rockwood Mfg. Co., Indianapolis, has issued two bulletins, one dealing with bases for small motors and the other with standard drive bases. Drawings illustrate the application of the base for floor, wall or ceiling drives.

COMPRESSORS—A line of feather valve motor driven compressors is illustrated and discussed in considerable detail in a booklet by the Worthington Pump & Machinery Corp., Harrison, N. J. A second bulletin describes Monobloc centrifugal pumps.

TURBINE PUMP—Roots-Connersville-Wilbraham, Connersville, Ind., has published bulletin 260-B11 on regenerative turbine pumps. The text discusses the design, gives data on capacities and heads, and provides a characteristic performance curve.

WELDING — Metal & Thermit Corp., 120 Broadway, New York, has published a new booklet describing thermit welding, an alumino-thermic process employed in welding heavy sections of ferrous metal. Illustrations indicate the types of work accomplished.

HANDLING EQUIPMENT—Cleveland Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O., has issued a folder illustrating and describing various installations of its tramrail equipment. Special emphasis is placed upon features of design, including the shape of the rail.

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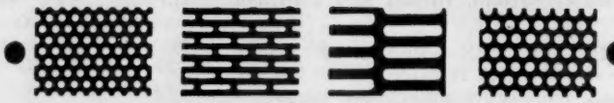

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